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Supreme Court of the United States

OCTOBER TERM, 1935

A. G. TRIPLETT, R. M. TRIPLETT, A. NELSON, C. M. TRIPLETT, JR., AND THE BALTIMORE GASLIGHT COMPANY,
Defendants-Petitioners,
vs.
PERCIVAL D. LOWELL, FRANCIS W. DUNMORE, and DUBILIER CONDENSER CORPORATION,
Plaintiffs-Respondents.

No. 388

BRIEF FOR RESPONDENTS

CLIFTON V. EDWARDS,
GAYLORD LEE CLARK,
JOHN B. BRADY,
Counsel for Respondents.

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Supreme Court of the United States

October Term—1935.

A. G. TRIPLETT, R. M. TRIPLETT, A. NELSON, C. M. TRIPLETT, JR., AND THE BALTIMORE GASLIGHT COMPANY, *Defendants-Petitioners,* vs. PERCIVAL D. LOWELL, FRANCIS W. DUNMORE, AND DUBILIER CONDENSER CORPORATION, *Plaintiffs-Respondents.*	No. 388

BRIEF FOR RESPONDENTS.

I. Statement.

This case is before this Court upon writ of certiorari to the Circuit Court of Appeals for the Fourth Circuit, to review a decree (Vol. I, p. 433) of that Court entered June 4, 1935, reversing a decree of the United States District Court for the District of Maryland entered July 20, 1934 (Vol. I, p. 276) in a patent infringement suit. The decree of the District Court directed the dismissal of the bill of compaint as to two of the letters patent in suit for invalidity, the Court adopting and following the reasoning of an earlier decision with respect to each of said patents by the Circuit Court of Appeals for the Third Circuit.

II. The History of the Litigation.

On August 17, 1933, respondents as plaintiffs filed the present suit in the United States District Court for the

District of Maryland, against the present defendants, charging infringement of three United States Letters Patent as follows:

No. 1,635,117 granted July 5, 1927, to Francis W. Dunmore; filed February 27, 1922.
No. 1,455,141 granted May 15, 1923, to Lowell & Dunmore; filed March 27, 1922.
No. 1,606,212 granted November 9, 1926, to Dunmore & Lowell; filed March 21, 1922.

At the opening of the trial in the District Court, the petitioners (defendants below) filed a motion (Vol. I, p. 19) to dismiss the bill of complaint as to said two patents (1,635,117 and 1,455,141), basing the motion upon the ground that plaintiffs had *unreasonably* delayed the filing of disclaimers with respect to said patents after decisions of the Circuit Court of Appeals for the Third Circuit holding certain claims of said patents invalid. Respondents filed answering affidavits (Vol. I, p. 24) setting forth the reasons for the delay and the motion was denied (Vol. I, pp. 46, 47).

Thereupon (Vol. I, pp. 48, 49) counsel for defendants-appellees was granted leave to file an amendment to the answer setting up invalidity of the patents by reason of unreasonable delay in filing disclaimer, as well as *inadequacy* of the disclaimer.

The trial then proceeded (Vol. I. p. 49) and the respondents proffered evidence which they proposed to introduce in support of the two patents held invalid in the Third Circuit (Vol. I, p. 57). The proffered evidence was excluded and respondents allowed an exception (Vol. I, pp. 128, 129). The proffered evidence was duly marked under the provisions of Equity Rule 46 (Vol. I, p. 129).

After due consideration the Court filed an opinion (Vol. I, p. 263) dismissing the bill of complaint as to the two patents, Nos. 1,635,117 and 1,455,141, upholding the validity of the third patent, No. 1,606,212, and directing an injunction and accounting with respect thereto.

From the decree (Vol. I, p. 276) entered on July 20, 1934 by the District Court, respondents appealed (Vol. I, p. 278) from such portion thereof as directed the dismissal of the bill of complaint with respect to patents Nos. 1,455,141 and 1,635,117, and petitioners appealed (Vol. I, p. 280) from those portions which upheld the validity of patent 1,606,212, found infringement thereof, and directed an injunction and accounting with respect thereto.

The Circuit Court of Appeals reversed the decree of the District Court insofar as the decree dismissed the bill with respect to patent 1,455,141 and 1,635,117, remanded the case for trial, and meanwhile withheld judgment with respect to the third patent 1,606,212 (Vol. I, p. 432).

Petitioners on August 21, 1935 applied to this Court for a writ of certiorari upon the ground that respondents had unreasonably delayed the filing of disclaimers as to the first two patents. That petition was denied by this Court on October 14, 1935.

On November 25, 1935, a petition for rehearing was presented representing that the issues in this case are so closely similar to those presented in the case of *The Mantle Lamp Company of America* v. *Aluminum Products Company*, certified to this Court by the Circuit Court of Appeals for the Seventh Circuit, that this case may be disposed of at the same time. Such petition was granted December 9, 1935. The order granting the writ assigned the case for argument immediately following No. 590, *The Mantle Lamp Company of America* v. *Aluminum Products Company*.

III. The Earlier Litigation in the Third Circuit.

Prior to the present litigation, the respondents had, on September 20, 1927, filed three separate bills of complaint in the United States District Court for the District of Delaware against the Radio Corporation charging infringement of each of said three letters patent separately. Because of the pendency of certain interference contests in the

Patent Office, hereinafter referred to, the suit was limited to certain claims not involved in the interference.

After a protracted trial the District Court, Judge Hugh M. Morris holding the Court, on August 12, 1929 (34 Fed. (2d), 450) held claim 9 of patent 1,635,117 covering the earliest invention, and claims 3 and 14 of patent 1,455,141 valid and infringed; the third patent was held not infringed. (*Dubilier Condenser Corporation* v. *Radio Corporation,* 34 Fed. (2d), 450).

The Radio Corporation appealed to the Circuit Court of Appeals for the Third Circuit from so much of the decree of Judge Morris as held the two patents valid and infringed; plaintiffs took no appeal.

The Circuit Court of Appeals, in an opinion by Judge Woolley, (*Radio Corporation* v. *Dubilier Condenser Corporation,* 59 Fed. (2d) 305, 309) reversed the decree of the District Court, holding the said claims there in suit to be invalid.

An order consolidating the cases for purposes of appeal having been made, and a petition for rehearing having been filed in the Circuit Court of Appeals with respect to patent 1,635,117, it was assumed that appellants' time to apply for writs of certiorari in both cases ran from the date of the denial of the petition for rehearing. This Court, however, on October 25, 1932, denied the petition with respect to patent 1,455,141 because not applied for in time, and denied the other petition without stating the reason (287 U. S. 648 and 650).

On July 8, 1933 respondents filed disclaimers. These disclaimers did not cancel or change any of the claims of the patents, but did in effect assert that respondents' interpretation of the term "means" in the claims was not the interpretation given thereto by the Circuit Court of Appeals for the Third Circuit, but was limited to the devices shown and described in the patent.

IV. History of the Invention and Litigation Seeking Possession Thereof.

The inventions in controversy, made in 1921 under circumstances set forth in *United States* v. *Dubilier Condenser Corp.*, 289 U. S. 178, made possible the operation of radio broadcast receiving sets from the ordinary household alternating lighting current, instead of from batteries as had been the previous universal practice.

The inventions were published, embodied in full-sized demonstration sets, and submitted to the leading and other receiving set manufacturers, who were urged, unsuccessfully, to become licensees and to place the inventions on the market. After approximately three years of unsuccessful efforts to induce set makers to put the inventions on the market agreements were made with the respondent Dubilier Condenser Corporation (Vol. I, pp. 371-380) which expended several hundred thousand dollars in commercial development (Vol. I, p. 231); and license agreements were made with several manufacturers. Up to and including 1927 the license fees amounted to $28,000 (Vol. I, p. 337).

About this time four interference contests were instituted in the Patent Office against patent 1,455,141 by rival inventors, some backed by powerful companies, seeking to wrest the invention from respondents. These rival contestants were Michael I. Pupin whose application was owned by the Westinghouse Electric & Manufacturing Company; Robert D. Duncan, Jr., whose application was owned by Wired Radio, Inc., a subsidiary of the North American Company; and Albert S. Blatterman (Vol. I, p. 24).

In the fall of 1927 the Radio Corporation of America and its associated companies manufactured and put upon the market large quantities of infringing alternating current operated receiving sets, with the result of substantially destroying the business built up under the patents by the Dubilier Condenser Corporation (Vol. I, p. 231), and ending the collection of royalties.

(34 Fed 2d 450)

Shortly after the decision of Judge Morris upholding the validity of the patents and finding infringement thereof, the United States on or about April 22, 1930 (Vol. I, p. 26) filed suits against respondents asserting ownership of the inventions and seeking to acquire title to each of the three patents (Vol. II, pp. 475, 536). Two of these suits were against respondent Lowell in the Eastern District of New York (Vol. II, pp. 475, 482); three against respondent Dunmore in the District of Columbia (Vol. II, pp. 489, 496, 503); three against respondent Dubilier Condenser Corporation in the District of Delaware (Vol. II, pp. 509, 516, 523; and one against the Morkrum Company, a licensee, in the District of Maine (Vol. II, p. 530).

The suit of the government against the respondent Dubilier Condenser Corporation to acquire title to the patents, was tried and decided by the District Court and upon appeal was decided by the Circuit Court of Appeals on May 24, 1932. On October 17, 1932 (287 U. S. 588) this Court granted a writ of certiorari in the government case to review the question of title, and that case was pending and undecided in this Court at the time of the denial of the writs of certiorari in the patent cases on October 25, 1932.

Also at the time of the denial of the petitions for certiorari in the patent cases the several interference contests had progressed through the Patent Office tribunals and had been decided in favor or respondents, but the unsuccessful rival contenders for the inventions, the Wired Radio, Inc. and Robert D. Duncan, Jr., in one case, and Albert S. Blatterman in another, had filed suits against respondents in the Supreme Court of the District of Columbia under section 4915, seeking a review of the question of priority and these suits were awaiting trial.

The bills of complaint in the government cases not only demanded title to the patents but also asked that respondents be treated as trustees and be made to account for all receipts from the patents.

This Court decided the title question in the suit against respondent Dubilier Condenser Corporation on April 10,

1933 (289 U. S. 178), but the suits against the respondents, Lowell and Dunmore, however, were still pending and the defendants were advised by counsel for the government that the Department of Justice had under consideration bringing these suits on for trial (Vol. I, p. 27).

The last of the title suits were dismissed on June 8, 1933 and July 3, 1933, respectively. (Vol. II, pp. 538, 539, 541, 546, 548).

On July 8, 1933 respondents filed the disclaimers hereinbefore referred to.

V. The Questions Presented by the Petition for Writ of Certiorari.

The present petition was granted December 9, 1935 (p. 4, par. 10) and is rested upon the ground that

> "The issues on the merits involved in petitioners' case are so closely similar to the questions involved in the case of "*The Mantle Lamp Company of American* v. *Aluminum Products Company*, which has been certified to this Court by the Court of Appeals for the Seventh Circuit, that the case may be disposed of on its merits at the same time." (Italics by counsel.)

Petitioners' brief refers (p. 7) only to the first of the questions certified in the *Mantle Lamp Company* case, i.e., whether the owner of a patent, some of the claims of which have been held invalid by the Circuit Court of Appeals in one circuit, may maintain a suit afterward brought "in the same judicial circuit" and against a different defendant when the owner "wholly failed and omitted to file any disclaimer" and a "reasonable time had elapsed" therefor.

The dismissal by the District Court in the case at bar was not based upon unreasonable or other delay in filing disclaimers, but rather upon the ground that the disclaimers did not materially alter the patents from what they

were when considered by the Circuit Court of Appeals for the Third Circuit and that even considering the evidence proffered by respondents the same conclusion was reached by the District Court as was reached by the Circuit Court of Appeals for the Third Circuit (See opinion, Vol. I, pp. 265, 266).

Furthermore the courts below found that under the exceptional circumstances in this case there was no enreasonable delay in filing disclaimers.

The record therefore presents the following questions:

1. Are the issues in this case so closely similar to those involved in the *Mantle Lamp Company* case as to be determinative of this case?

2. Is a patentee barred from any further suit after the first decision of a Circuit Court of Appeals holding the patent invalid?

3. Was the decision of the Circuit Court of Appeals for the Fourth Circuit in error in holding that the District Court should have received the evidence proffered on behalf of the respondents in this case?

ARGUMENT.

Point I.

There Is Substantial Difference Between the Questions Presented in This Case and Those Presented in the Mantle Lamp Case.

The case at bar differs from the *Mantle Lamp* case in two important particulars. (1) The instant suit is not brought in the same ~~district~~ CIRCUIT in which the previous suit was brought. (2) Both Courts below held in the case at bar that respondents were not guilty of unreasonable delay in filing disclaimers.

(1) In the *Mantle Lamp* case after the decision of the Circuit Court of Appeals for the Seventh Circuit holding

certain claims invalid, suit was brought in the Sixth Circuit. No question seems to have been raised in the Sixth Circuit, or is presented by the questions certified to this court by the Circuit Court of Appeals for the Seventh Circuit, as to the propriety of the Circuit Court of Appeals for the Sixth Circuit entertaining the bill of complaint and upholding the validity of the patent. The questions certified to this Court relate only to the propriety of asking the Circuit Court of Appeals for the Seventh Circuit to review its own previous decision.

(2) The first question certified in the *Mantle Lamp* case specifies that "a reasonable time had elapsed for filing such disclaimer." This seems to imply that mere length of time alone is determinative. If that be the true criterion regardless of circumstances, the case at bar differs materially from the *Mantle Lamp* case in that in that case apparently there was a delay of some five or six years, whereas the utmost that is charged against respondents is eight months and thirteen days (Petitioners' brief, p. 30).

Point II.

The Filing of a Disclaimer Was Not Unreasonably Neglected or Delayed.

Both Courts below so found.* The question of unreasonable delay is a question for the Court upon the facts. As the statute fixes no period of time as "unreasonable" that word has been construed by the Courts to be a delay "unreasonable in view of all the circumstances". While petitioner admits in its brief (pp. 16 and 42) that exceptional or extenuating circumstances may account for and excuse delay in filing a disclaimer, it is not without significance that petitioner scrupulously avoids in its brief a *single reference* to the *exceptional circumstances* in the present case.

*Vol. I, pp. 45-47; Vol. I, p. 427.
Where both Courts below concur in findings of fact and conclusions of law their judgment should be affirmed unless error clearly appears. *Montebeliano Y. Ramos* v. *La Compagnia General*, 241 U. S., 455; *United States* v. *Carter*, 217 U. S., 286, at p. 319.

At the time of the denial of their petitions for certiorari by the Court October 25, 1932 the Government title suit against Dubilier Condenser Corporation before this Court was pending undecided. There was a grave question, as indicated by the dissenting opinions of this Court (289 U. S. 178, 209) as to whether respondents had the right to file disclaimers. If the patentees were held not entitled to their inventions and not to have a good title to the patents, it may well be that they would still be held accountable as Trustees to the Government for any income therefrom during the period they held title and any disclaimer filed by them be also held ineffective as to any rights disclaimed. Again, wholly aside from their legal rights or duties, good faith required that the patentees make no disposition of or impair rights granted by the patents during the pendency of the title suits.

The decision of this Court in the title suits against Dubilier Condenser Corporation was rendered April 10, 1933. But for three months thereafter respondents were still uncertain of their title because Government counsel expressed an intention on their part to bring to trial one or more of the other title suits pending against the inventors in New York and in the District of Columbia. It was not until June 8, 1933 and July 3, 1933 that the last of the title suits brought by the Government were dismissed.

July 8, 1933, only seventy-nine days* after the decision of this Court on the question of title to the patents, and five days after the dismissal of the last of the title suits against

*In *Minerals Separation Ltd. v. Butte & Superior Mining Co.*, 250 U. S. 336, 354, a delay of three months after a decision of this Court invalidating a certain claim was held not to be unreasonable in view of the fact that the patentees resided in a foreign country.

In *Ensten v. Simon Ascher & Co.*, 282 U. S. 445, the period condemned was twenty-three months.

In *Radio Condenser Co. v. General Instrument Corp.*, 65 Fed. (2d) 458, the period condemned was more than three years.

In *Otis Elevator Co. v. Pacific Finance Corp.*, 68 Fed. (2d) 664, the period condemned was one year and two months.

In *General Chemical Co. v. Standard Wholesale Phosphate and Acid Works* (C.C.A. Fourth Circuit) 77 Fed. (2d) 230, a delay of thirty-eight days was held not unreasonable. Certiorari denied October 14, 1935, No. 264; rehearing denied December 23, 1935.

the inventors, these respondents within the letter and the spirit of the disclaimer statute gave notice to the public, both that they did not accept or acquiesce in the decision of the Circuit Court of Appeals for the Third Circuit and that they did not interpret the term "means" as claiming the broad subject matter attributed to them by that Court.

A chronological statement of the important steps in this protracted litigation, annexed as Appendix "B" gives a bird's eye view of the facts facing the patentees. This statement clearly shows that after the bringing of the title suit by the Government the *question of title* was given priority of consideration by the courts, and rightly so, over the patent litigation.

During this period also the interference contests further beclouded the situation as to whether any of the several alleged inventors was prior to these patentees. Since the interpretation of the term "means" adopted by the Circuit Court of Appeals in holding the claims there in suit invalid, if applied to the other claims of the patents would make them invalid also, any disclaimer cancelling any of the claims would in all probability have led to decrees awarding the claims to one or more of the other contestants who would have been free to start litigation thereon anew. Hence the public would have gained nothing by a disclaimer which canceled the claims.

Furthermore, in view of the complexity of the subject matter, more than ordinary time was required to study the electrical circuits of infringing apparatus, and to procure legal proof of infringement.

We submit that the Courts below were fully justified in finding that under the circumstances respondents proceeded with reasonable promptness particularly in view of the burden and uncertainty of the title litigation, the interference contests, the limited resources of the respondents and the necessity of finding and examining a provable instance of infringement in the new district and giving suitable notice to the infringer.

Point III.

The Disclaimers Were Not Invalid, Nor Did They Admit Invalidity of the Claims in Suit.

The disclaimers did not in fact cancel any claims, change the wording thereof or the wording of the specification, nor did they subtract or add any elements, or seek to give any meaning to the claims other than, as stated in the opinion of the Circuit Court of Appeals for the Fourth Circuit (77 Fed. (2d) 556, 557; Vol. I, p. 419):

> "to ensure that the broad language of the claims would be given more definite meaning by reference to the disclosures of the patent so as to cover what is there described, or the equivalent thereof, in accordance with the well-established rule that in interpreting the language of a claim, the words are not to be taken literally but in the sense in which they were used by the inventor as disclosed in his specification. Elevator Supplies Co. v. Graham & Norton Co. (C.C.A. 44 F. (2d) 354; Westinghouse v. Boyden Power-Brake Co., 170 U. S. 537, 568, 569, 18 S. Ct. 707, 42 L. Ed. 1136."

Disclaimers of this type have long been recognized as proper. One prominent example is the disclaimer involved in *Carnegie Steel Co.* v. *Cambria Iron Co.*, 185 U. S. 403, 435, where the claim was not changed but an explanatory change was made in the specification, and this Court said:

> "In the case under consideration the disclaimer was not of a claim but of certain statements in the specification, which if retained might be construed to have the effect of illegally broadening the second claim. The first statement disclaimed was that the invention might be practiced by *merely* receiving a number of small portions of metal taken from different ladles, the mixing being performed merely by the act of pouring into the charging ladle. The use of the word 'merely' ignored the steps embodied in the second claim, where the mixing is not performed by merely pouring together the several charges into a ladle, but by maintaining a permanent

quantity of metal in the reservoir, to which charges were alternately added and from which they were withdrawn. The other clauses were intended to disclaim the casting of the metal into pigs. We think there is no force in the criticism that a disclaimer may not extend to a part of the specification, as well as to a distinct claim. *Hurlbut* v. *Schillinger,* 130 U. S. 456; *Schillinger* v. *Gunther,* 17 Blatch. 66; *Schwartzwalder* v. *New York Filter Company,* 26 U. S. App. 547. Had the purpose of the disclaimer been to reform or alter the description of the intervention, or convert the claim from one thing into something else, it might have been objectionable, as patents can only be amended for mistakes of this kind by a reissue. But the disclaimer in this case appears to have been made to obviate an ambiguity in the specification, and with no idea of obtaining the benefit of a reissue. If the clauses had the effect of broadening the patent the disclaimer removes the objection. If they did not, the disclaimer could do no harm, and cannot be made the subject of criticism."

The disclaimer in the *Carnegie* case is referred to, apparently with approval, in the decision in the *Altoona Publix Theatres* case. (See footnote 294 U. S. 490).

See also disclaimers in *Minerals Separation, Ltd.* v. *Butte & Superior Co.,* 250 U. S. 336, 354; *Marconi Wireless Telegraph Co.* v. *DeForest Radio Telephone & Telegraph Co.,* 243 Fed. 560, 565; *United Chromium Inc.* v. *International Silver Co.,* 60 Fed. (2d) 913, 914; and *Seiberling* v. *Thropp's Sons Co.,* 284 Fed. 746, 756, 757, all of which are referred to, apparently with approval, in the above cited footnote in the *Altoona Publix Theatres* case.

In the case at bar the disclaimers merely assert a *narrower* interpretation of the claims than that given to them by the Circuit Court of Appeals for the Third Circuit, and the patentees stand upon their right to have the term "means" interpreted, as by law they are entitled to have it interpreted, i. e., to be the same, or substantially the same as the means shown and described in the specifications. *Westinghouse* v. *Boyden Power Co.,* 170 U. S. 537, 568, 569;

Elevator Supplies Co. v. *Graham & Norton Co.*, 44 Fed. (2d) 354; *Davis Sewing Machine Co.* v. *New Departure Mfg. Co.*, 217 Fed., 775 (C. C. A. 6th Cir.).

Nor did the disclaimers admit invalidity of any claims. In *Altoona Publix Theatres Corp.* v. *American Tri-Ergon Corp., et al.*, 294 U. S. 477, cited by petitioners, this Court held that no invention was involved in employing a flywheel to impart uniform motion to a motion picture film (p. 483). One of the claims, claim 13 called for an apparatus "comprising a photoelectric cell, means for imparting to the film a rapid and uniform motion longitudinally of the film past said cell, * * *."

The patent owners disclaimed the combination of the claim "except *wherein a flywheel is operatively connected* with the film through means which imparts uniformity of motion of the flywheel to the film." This clearly was adding a new element, i. e., the flywheel, to the "means for imparting" etc. It was not seeking interpretation of the claim as it stood and since this Court had held that no invention was involved in the apparatus without the flywheel (p. 483) nor in the addition of a flywheel (p. 483), nothing was left for the patentee to claim.

Point IV.

The Instant Suit Is Authorized by Statute and by Judicial Construction Thereof.

No case has been cited by petitioner denying the right of a patentee, defeated in the Circuit Court of Appeals for one circuit, and who has not acquiesced in that decision and who proceeds with reasonable diligence under the circumstances, to sue a different defendant in another circuit and there seek a contrary decision.

Nor has any decision been cited to the effect that upon the first decision against the validity of some or all of the claims of a patent the patentee must forthwith disclaim himself out of Court so far as any further proceedings elsewhere are concerned.

We respectfully submit that the first question certified to this Court by the Circuit Court of Appeals for the Seventh Circuit overlooks entirely the law as laid down by this Court in *Ensten* v. *Simon Ascher & Co.*, 282 U. S. 445, and also overlooks the fundamental character of letters patent for an invention.

(1) In *Ensten* v. *Simon Ascher & Co.*, 282 U. S. 445, this Court laid down no rule fixing the number of days or months within which a patentee must file a disclaimer, nor did it rule that in every circumstance a disclaimer must be filed. On the contrary it was made clear that a patentee must act "with such promptness *as the circumstances permit*" and that two courses are open to him, i.e., either *to vindicate his position,* or file a disclaimer. This Court said (p. 455):

> "When a competent court has declared his pretensions without sufficient foundation, we think good faith and the spirit of the enactment demand that he act with such promptness as the circumstances permit either *to vindicate his position* or to relieve the public from further evil effects of his false assertion." (Emphasis by counsel.)

So far from fixing an exact time limit, this Court said (p. 453):

> "The question of unreasonable delay is a question for the court, upon the facts as found either by its own investigation or the verdict of a jury."

In the *Ensten* case the patentee's claim had been held invalid by a decree of a District Court, *from which no appeal was taken.* The patentee then (p. 455)

> "continued to hold himself out as possessor of the sole right to 'make, use and vend' under the rejected claim for *nearly* **two years.** *Then he abandoned it.*" (Emphasis by counsel.)

Thus the patentee acquiesced in the holding of invalidity and then held the claim for nearly two years before he abandoned it.

Nor, we submit is anything found in the *Ensten* case indicating any departure from the established rule that in the absence of estoppel, and absence of unreasonable delay the decision of one Circuit Court of Appeals has only the weight of comity in another circuit. *Mast Foos & Co.* v. *Stover Mfg. Co.*, 177 U. S. 485; *Sanitary Refrigerator Co.* v. *Winters*, 280 U. S. 30.

Cases following this long established rule were cited in the footnote to the opinion of the Circuit Court of Appeals for the Fourth Circuit (Vol. I, p. 429) and are listed hereinafter in Appendix A.*

Petitioners' brief (pp. -6, 17) and again in the appendix (p. 42) criticizes the accuracy of the statements in the footnote of the opinion. Only three minor misstatements are pointed out; these are identified in our Appendix A. Petitioners' criticisms in the main merely point out that in some of the cases cited the second suit in which the patent was held to be valid was copending at the time the patent was held to be invalid in the earlier case, or that at the time one Court first held the patent to be invalid there was outstanding an earlier decision holding the patent valid.

By urging these distinctions petitioners are in effect admitting that disclaimers are not required if the patentee is vindicating his position by the mere pendency of another suit.

(2) Petitioners' argument (p. 11) that once there has been a finding of invalidity, there is no reason why the patentee should again be allowed to assert validity overlooks the basic nature of the patent right and the decree of the Court in an infringement suit.

The patent right is a grant by the government, issued after compliance with statutory requirements. The decree of the Court in an infringement suit does not decree *cancellation* of that grant; it merely holds that the grant was invalid as between the patentee and the infringer. The effect is not at all the same as though there had been a de-

*The alleged errors are considered specifically in Appendix A.

cree of cancellation. The patentee is still left with his grant, and the fact that in the opinion of one Court the grant is invalid does not bar another Court from holding that the grant is valid.

In *U. S.* v. *Bell Telephone Co.*, 128 U. S. 315, 372 this Court pointed out:

> "In the first place, the right given to the infringer to make this defense is a right given to him personally, and to him alone, and the effect of a successful defense of this character by one infringer is simply to establish the fact that, as between him and the patentee, no right of action exists for the reasons set up in such defense. But the patentee is not prevented by any such decision from suing a hundred other infringers, if so many there be, and putting each of them to an expensive defense, in which they all, or some of them may be defeated and compelled to pay because they are not in possession of the evidence on which the other infringer succeeded in establishing his defense. On the other hand, the suit of the government, if successful, declares the patent void, sets it aside as of no force, vacates it or recalls it, and puts an end to all suits which the patentee can bring against anybody. It opens to the entire world the use of the invention or discovery in regard to which the patentee had asserted a monopoly."

Though "the patentee is not prevented by any such decision from suing a hundred other infringers," the expense and other considerations impose a practical limitation. It is a significant thing that the industry of counsel has only succeeded in finding two outstanding cases in which the patentee had the persistence to bring a third action after two different courts had held the patent invalid, i. e., *The Barbed Wire Patent*, 143 U. S. 275, and *Diamond Rubber Co.* v. *Consolidated Rubber Tire Co.*, 220 U. S. 428.

Since respondents were not guilty of unreasonable delay in making their position known and proceeding to vindicate their position, the question here resolves itself into the simple question of whether one whose patent in the first

litigation thereon is upheld by the District Court and then held invalid by the Circuit Court of Appeals, is obliged to file a disclaimer and thereby end all further proceedings thereon; thus taking away the right, heretofore universally recognized, to seek a contrary result in another circuit against another defendant, and thereby afford an opportunity for review by this Court by reason of contrary decisions in two different courts.

One of the purposes of the Act of 1891 (26 Stat. p. 826—31 Stat. p. 660) establishing the several Circuit Courts of Appeals was to permit this very thing, and, we submit, with sound reason.

The object of the Patent laws is to encourage invention and nothing in the disclaimer statutes, which are remedial statutes, indicates any intention of Congress to permit a valuable patent to be destroyed merely because in one case the inventor may be unsuccessful from causes wholly unrelated to the merits of his case, for example, failure to get his witnesses together, or misapprehension of a fact by the court, or the opinion of one tribunal only.

In *Page Machinery Co.* v. *Dow-Jones & Co.*, 168 Fed. 703, the Circuit Court of Appeals for the Second Circuit, in disapproving the then prevailing practice of requiring a disclaimer as a condition for appeal where the District Court had held one or more claims invalid, pointed out the injustice of requiring the inventor to accept the opinion of a single judge. The same reason exists where the decision is by a single court of appeals, especially where, as here, the District Court had held the patents to be valid.

Moreover, our patent system is kept alive and prevented from falling into a narrow or sectionalized interpretation of the patent law, by receiving the opinions of district judges in all parts of the country. Divergent views in the same circuit are harmonized by the Circuit Court of Appeals in that circuit, and divergent views between different Circuit Courts of Appeals harmonized by this Court. The surprising thing about the system is not that divergent

views arise between different Circuit Courts of Appeal, but rather that the number of cases in which such divergence of opinion exists is such a small percentage of the large number of patent cases heard every year by the various Circuit Courts of Appeals.

It would be manifestly unjust to exclude patentees from the right possessed by other litigants to sue another defendant in a second case and therein make a more complete showing, for example as in *Dowagiac Mfg. Co.* v. *Minnesota Plow Co.*, 235 U. S., 641; *Hanover Star Milling Co.* v. *Metcalf*, 240 U. S., 403.

The case most heavily relied upon by petitioners appears to be *R. Hoe & Co.* v. *Goss Printing Press Co.*, 31 Fed. (2d) 565. In that case the Circuit Court of Appeals for the second Circuit merely held that if plaintiff there desired to proceed further *in that case*, it must disclaim within thirty days. No question arose as to the right of the patentee to proceed elsewhere without accepting the decision of that Court and nothing in the Court's opinion negatived the right to do so. By inference the decision recognized the right of the plaintiff to abandon further proceedings in that case and proceed elsewhere since it gave plaintiff thirty days in which to decide.

In *Radio Condenser Co.* v. *General Instrument Co.*, 65 Fed. (2d) 458, the District Court held that a delay of approximately FIVE YEARS (April 17, 1928 to February 26, 1932, p. 459) after ACQUIESCING in a decision of the Patent Office that the patentee was not the inventor was unreasonable. Apparently the case was not appealed to the Circuit Court of Appeals. In any event no such delay is involved here.

In *Better Packages Inc.* v. *Nashua Package Sealing Co.*, 6 Fed. Supp. 573 and 74 Fed. (2d) 679 on appeal, where previously a claim had been held to be invalid the plaintiff had *acquiesced in the adverse ruling by taking no appeal.* After eighty-three days a new suit was brought *in the same court.* Apparently no excuse was given as to why appeal

was not taken in the first case. The District Court held that the delay was unreasonable. The circumstances, other than above stated, do not appear.

In the Ninth Circuit in *Otis Elevator Co.* v. *Pacific Finance Corp.*, 68 Fed. (2d) 664, a special master had found a claim to be invalid for failure to comply with Section 4888 of the Revised Statutes, the claim being so broad as to be ambiguous. *No exception was taken to this finding.* The Circuit Court of Appeals held that:

> "The specific question whether or not a claim invalid only for indefiniteness invalidates the entire patent appears to be an open one."

But the Court also held that the claim there involved covered more than that of which the patentee was the original or first inventor and hence that a disclaimer *was* required. No other excuse was offered by the plaintiff for its delay of FOURTEEN MONTHS (p. 671) and the ruling of the Court was that under the circumstances of that case the delay of fourteen months was too long.

Thus in all of the cases cited by petitioner the patentee had *acquiesced* in a finding of invalidity and then waited for various periods of time deemed by the Court to be unreasonable under the circumstances of that case, before disclaiming or seeking to vindicate his position.

There was no acquiescence by respondents in the case at bar.

Point V.

The Circuit Court of Appeals Was Right in Directing a New Trial by the District Judge.

The decree of the District Court which was reversed by the Circuit Court of Appeals in this case was not based upon delay in filing a disclaimer. The basis was that the disclaimers did not materially alter the claims and that the case stood on substantially the same ground as the case in

the Third Circuit and that therefore the Court would follow the Circuit Court of Appeals for the Third Circuit and hold the two patents invalid.

This ruling therefore in effect held (Vol. I, p. 263) that even assuming the truth of all the facts asserted in the plaintiffs' proffered proofs, the patents would be invalid.

The inventions are described in detail in Appendix C.

The District Court, Judge Coleman, pointed out (Vol. I, pp. 264, 265) by quoting from the opinion of the Circuit Court of Appeals for the Third Circuit that that Court thought with respect to patent 1,455,141 that if Lowell and Dunmore

> "had invented this apparatus and all its elements, their invention unquestionably would have been basic; it would have been more than that; it would have been stupendous, for it would have covered the major portion of the practical radio art as it stands today."

And that as to the means employed for carrying out the invention, the Circuit Court of Appeals had held:

> "Therefore, in the final analysis, the claimed invention *consists in applying curbed alternating current to the detector section and the audio frequency amplifier section and also to the radio frequency amplifier section in the same way that it had previously been applied to the last-named section.* Is this invention?" (Emphasis by counsel.)

And with respect to patent 1,635,117, that the Circuit Court of Appeals had said (pp. 266, 267):

> "The invention, as the plaintiffs state in a few words, consists of means for imparting positive potential to the plate and negative potential to the grid electrodes of a vacuum tube by low frequency alternating current. They say this was new and very useful and therefore amounted to invention, and that Dunmore was the first in the art to conceive and apply it."

As to the means for carrying out the invention, the Circuit Court of Appeals had said (Vol. I, p. 266):

> "But Dunmore says he did more than (b) substitute electric power of one kind for electric power of another kind, defined by their respective sources, in that he (c) rectified or converted the substituted ineffective alternating current into workable direct current. This certainly he did, and if he were the first to do it, or if he did it in a new way it might be invention."

And further that Dunmore did no more than use rectified and filtered current from a Hull filter, thus making the tube operate as though it received direct current from a battery.

Thus it is clear that the Circuit Court of Appeals for the Third Circuit thought that Lowell and Dunmore had done no more than apply "curbed" alternating current to the several sections of the instrument, and that Dunmore had done no more than apply rectified current to the plate and grid circuits of the amplifier, and that this so-called curbed current was the same at battery current so far as concerned its effect upon the instrument.

The issues in the litigation in the Third Circuit therefore were two in number, i.e.:

(1) Did the "means" for eliminating hum in the patents mean merely the use of a so-called Hull filter for changing alternating current to direct current, thereby making the tubes and the receiving set operate the same as in direct current receiving sets, or the mere duplication of a "mid-point" connection?

(2) Was current from the Hull filter the equivalent of direct current from a battery and did a mid point connection produce the same effect as battery current?

The latter questions of fact were the basis and foundation of both opinions of the Circuit Court of Appeals for the Third Circuit. If, in point of fact, an old and well known device transformed alternating current into direct current, the full equivalent of battery current, so that the

set operated indifferently upon current from that device or from a battery, it is easy to see that no invention would be involved.

But if, in point of fact, the current from such earlier device was not the equivalent of battery current and was itself fluctuating to such an extent as to produce upon the grids of the tubes a rising and falling voltage which would be multiplied in the tubes and thereby caused to drown out or distort the signal, a far different situation would exist, a situation, indeed, which the Circuit Court of Appeals for the Third Circuit substantially admitted would involve i vention of a high order to overcome.

The proofs proffered to the District Court consisted of testimony and demonstrations showing that no filtering device, short of one so elaborate and expensive in character as to render its use prohibitive in a radio broadcast receiver, could transform the household alternating current into the equivalent of battery current.

Upon the proffer and rejection of such proof it is to be assumed for the purposes of the hearing in the Circuit Court of Appeals and this Court that the facts are as asserted in the proffered proofs.

VI.

Conclusion.

It is submitted that the decree of the Circuit Court of Appeals for the Fourth Circuit was right in reversing said decree of the District Court.

Respectfully submitted,

CLIFTON V. EDWARDS,
GAYLORD LEE CLARK,
JOHN B. BRADY,

Counsel for Respondents.

APPENDIX A.

Cases in Which Patents or Trade-Marks Held Invalid in One Circuit Subsequently Have Been Held Valid in Other Circuits.

(Including corrections as indicated in footnotes.)

(Except as noted in footnotes the list is as given in the opinion of the Circuit Court of Appeals, Vol. I, p. 429.)

I.

Cases in the Supreme Court Prior to the Establishment of the Circuit Court of Appeals:

The Barbed Wire Patent, 143 U. S. 275, although no diversity of opinion existed in the lower courts, indicates the practice prior to the act establishing the Circuit Courts of Appeal.

The original patent had been held to be invalid by the Circuit Court for the Northern District of Illinois. *Washburn & Moen* v. *Haish,* 4 Fed. 900. The patent was then reissued and in *Washburn & Moen Mfg. Co.* v. *Fuchs,* 16 Fed. 661, 667, the Circuit Court for the Eastern District of Missouri held the reissue to be unwarranted and void. Suits were then brought upon the original patent in the Circuit Court for the Northern District of Iowa (*Washburn & Moen Mfg. Co.* v. *Beat 'Em All Barbed-Wire Co.,* 33 Fed. 261), the patent was again held invalid. The Supreme Court held the original patent to be valid.

II.

Cases in the Supreme Court Where the Patent Was Held Invalid by the Circuit Court of Appeals in One Circuit, and Later Held Valid by the Circuit Court of Appeals in Another Circuit:

Expanded Metal Co. v. *Bradford,* 214 U. S. 366. The patent was held to be invalid by the Circuit Court of

Appeals for the Third Circuit. *Bradford* v. *Expanded Metal Co.*, 146 Fed. 984. After the decree in the Circuit Court of Appeals for the Third Circuit, plaintiff filed a bill against another defendant in the Northern District of Ohio, the District Court held the patent to be invalid on the authority of the case in the Circuit Court of Appeals for the Third Circuit (157 Fed. 564). On appeal the Circuit Court of Appeals for the Sixth Circuit reversed this finding and held the patent to be valid. *Expanded Metal Co.* v. *General Fireproofing Co.*, 164 Fed. 849. On certiorari from the decree in the Sixth Circuit the Supreme Court held the patent to be valid.[1]

Diamond Rubber Co. v. *Consolidated Rubber Tire Co.*, 220 U. S. 428. The patent was held to be invalid by the Circuit Court of Appeals for the Sixth Circuit in *Goodyear Tire & Rubber Co.* v. *Rubber Tire Wheel Co.*, 116 Fed. 363; also by the same court in *Rubber Tire Wheel Co.* v. *Victor Rubber-Tire Co.*, 123 Fed. 85. In subsequent litigation the Circuit Court of Appeals for the Second Circuit held the patent to be valid. *Consolidated Rubber Tire* v. *Firestone Tire & Rubber Co.*, 151 Fed. 237; also in *Consolidated Rubber Tire Co.* v. *Diamond Rubber Co.*, 162 Fed. 892. The Supreme Court held the patent to be valid.

Dowagiac Mfg. Co. v. *Minnesota Moline Plow Co.*, 235 U. S. 641, did not involve the validity of the patent, but the Circuit Court of Appeals for the Sixth Circuit had held

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(1) In *Expanded Metal Co.* v. *Bradford*, 214 U. S. 366, petitioner asserts, without citing authority, that the bill in the second suit was filed February 10, 1904, which was prior to the rendition of the decision of the Circuit Court of Appeals for the Third Circuit holding the patent invalid. See statement in opinion of this Court, 214 U. S. 366, 374.

The statement has been amended by inserting the word "having" after the words—Third Circuit, plaintiff—and by changing the period after the word "Ohio" in the next line to a comma, and changing the capital letter T immediately following to a small letter. The change, of course, does not change the fact that after the Circuit Court of Appeals for the Third Circuit on Sept. 10, 1906, held the patent invalid, the patentee during a period of more than *two years* intervening before the decision of the Circuit Court of Appeals for the Sixth Circuit on Oct. 16, 1908, filed no disclaimer, and indeed never did file a disclaimer. Petitioners' criticism of this citation implies that the pendency of litigation in another circuit was proper and constituted an excuse for not filing any disclaimer.

plaintiff to be entitled to defendant's entire profits. *Brennan & Co.* v. *Dowagiac Mfg. Co.*, 162 Fed. 472. Subsequently the Circuit Court of Appeals for the Eighth Circuit held plaintiff to be entitled only to nominal damages. *Dowagiac Mfg. Co.* v. *Minnesota Moline Plow Co.*, 183 Fed. 314. The Supreme Court, after stating the law, substantially followed the ruling of the Eighth Circuit but reversed the decree for special reasons.

Hanover Star Milling Co. v. *Metcalf*, 240 U. S. 403. A suit on the trademark "Tea Rose" was dismissed by the Circuit Court of Appeals for the Fifth Circuit. *Metcalf* v. *Hanover Star Milling Co.*, 204 Fed. 211. In a suit in the Seventh Circuit filed shortly before the decision in the Fifth Circuit, the Circuit Court of Appeals for the Seventh Circuit upheld plaintiff's rights in part. *Hanover Star Milling Co.* v. *Allen & Wheeler Co.*, 208 Fed. 513. Because of a diversity upon fundamental questions, the Supreme Court took both cases and decided the questions in dispute.

Railroad Supply Co. v. *Elyria Iron Co.*, 244 U. S. 285. In copending cases the patent was held invalid by the Circuit Court of Appeals for the Sixth Circuit. *Railroad Supply Co.* v. *Elyria Iron Co.*, 213 Fed. 789, and valid by the Circuit Court of Appeals for the Seventh Circuit. *Railroad Supplies Co.* v. *Hart Steel Co.*, 222 Fed. 261. The Supreme Court held the patent invalid.

Abercrombie & Fitch Co. v. *Baldwin*, 245 U. S. 198. The original Letters Patent were held not infringed (²) by the Circuit Court of Appeals for the Seventh Circuit. *Bleser* v. *Baldwin*, 199 Fed. 133. The patent was then reissued and the reissue held void by the Circuit Court of Appeals for the Third Circuit. *Grier Bros. Co.* v. *Baldwin*, 219 Fed. 735. The Circuit Court of Appeals for the Sec-

(²) *Abercrombie & Fitch* v. *Baldwin*, 245 U. S. 198. The words "not infringed" have been inserted in lieu of the word—invalid—. See statement in this Court, 245 U. S. 198, 200.) After the decision of the Circuit Court of Appeals for the Third Circuit holding the patent invalid, on January 22, 1915, during the intervening period of upwards of nine months before the opinion of the Circuit Court of Appeals for the Second Circuit on November 9, 1915, plaintiff continued without disclaimer, and no disclaimer was filed thereafter.

ond Circuit then held the reissue patent to be valid. *Baldwin v. Abercrombie & Fitch Co.*, 228 Fed. 895. The Supreme Court held the patent to be valid and subsequently (*Simmons Co.* v. *Grier Bros. Co.*, 258 U. S. 82, upheld an application to reopen the case in the Third Circuit.

T. H. Symington Co. v. *National Malleable Castings Co.*, 250 U. S. 383. The question was one of priority as between Emerick and Byers. The Circuit Court of Appeals for the Seventh Circuit held that Emerick was prior. (*Miner* v. *T. H. Symington Co.*) 229 Fed. 730. Subsequently the Circuit Court of Appeals for the First Circuit held Byers to be prior. (*National Malleable Castings Co.* v. *T. H. Symington Co.*, 230 Fed. 821.) The Supreme Court held Byers to be the prior inventor.

Meccano, Ltd. v. *John Wanamaker*, 253 U. S. 136. The District Court in the Southern District of Ohio upheld the patent. The Circuit Court of Appeals for the Sixth Circuit (246 Fed. 603) reversed the District Court and held the patent invalid. Meanwhile suit had been brought in the Southern District of New York where a preliminary injunction was granted and an appeal was taken therefrom. After the decision of the Circuit Court of Appeals for the Sixth Circuit, motion was made before the Circuit Court of Appeals for the Second Circuit to dismiss the New York case. The Circuit Court of Appeals for the Second Circuit (*Meccano, Ltd.* v. *John Wanamaker*, 250 Fed. 250) denied the motion and subsequently (*Meccano* v. *John Wanamaker*, 250 Fed. 450) reversed the order granting a preliminary injunction, at the same time expressing the opinion that the patent was invalid. On certiorari the Supreme Court affirmed the Second Circuit, stating that the matter for review was "upon the preliminary order for injunction and we may go no further," and remanded the cause to the District Court for further proceedings.

New York Scaffolding Co. v. *Chain Belt Co.*, 254 U. S. 32. After the Circuit Court of Appeals for the Eighth

Circuit had held the patent to be valid,(3) *New York Scaffolding Co.* v. *Whitney*, 224 Fed. 452, and the Circuit Court of Appeals for the Third Circuit had held the patent to be invalid (*New York Scaffolding Co.* v. *Liebel-Binney Construction Co.*, 243 Fed. 577), the Circuit Court of Appeals for the Seventh Circuit held the patent to be valid (*Chain Belt Co.* v. *New York Scaffolding Co.*, 245 Fed. 747). The Supreme Court held the patent to be invalid.

John E. Thropp's Sons' Co. v. *Seiberling*, 264 U. S. 320. The Circuit Court of Appeals for the Sixth Circuit held two claims invalid. *Seiberling* v. *Firestone Tire & Rubber Co.*, 257 Fed. 74. After qualified disclaimers, the Circuit Court of Appeals for the Third Circuit held the patent as qualified by the disclaimers valid (284 Fed 746). The Supreme Court held the patent to be invalid.

Corona Co. v. *Dovan Co.*, 276 U. S. 358. The patent was first held invalid by the Circuit Court of Appeals for the Second Circuit. *Dovan Chemical Co.* v. *National Analine & Chemical Co.*, 292 Fed. 555. The patent was then held valid by the Circuit Court of Appeals for the Third Circuit, 10 Fed. (2d) 598. The Supreme Court held the patent to be invalid.

Saranac Automatic Machine Corp. v. *Wirebounds Co.*, 282 U. S. 704. The patent was held invalid by the Circuit Court of Appeals for the Seventh Circuit in *Wirebounds Patents Co.* v. *Gibbons Box Co.*, 25 Fed. (2d) 363. Subsequently the Circuit Court of Appeals for the Sixth Circuit held the patent valid and infringed, 37 Fed. (2d) 830. The Supreme Court held the patent invalid.

Radio Corp. v. *Radio Laboratories*, 293 U. S. 1. After the Supreme Court had held DeForest to be the prior inventor the Circuit Court of Appeals for the Second Circuit held Armstrong to be the inventor 66 Fed. (2d) 768. The Supreme Court upheld DeForest.

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(3) The word "valid" in line 4 has been substituted for—invalid—. The change of course does not avoid the fact that after the decision of the Circuit Court of Appeals for the Third Circuit holding the patent to be invalid, the patentee persisted in his claim before the Circuit Court of Appeals for the Seventh Circuit.

III.

Cases in Circuit Courts of Appeals Where the Patent Was First Held to Be Invalid by One Circuit Court of Appeals and Later Held to Be Valid by Another Circuit Court of Appeals (omitting cases which reached the Supreme Court):

Maitland v. *Goetz Co.*, 86 Fed. 124 (Second Circuit). Stiringer patent held invalid by Circuit Court of Appeals for the Third Circuit. *Maitland* v. *Gibson*, 63 Fed. 840. Patent then surrendered and reissued by narrowing claim 1. The reissued claim 1 held valid by Circuit Court of Appeals for the Second Circuit.

McNeely v. *Williames*, 96 Fed. 978 (Third Circuit). Certain claims were held invalid in 1890 by the Circuit Court of Appeals for the Second Circuit (*Williames* v. *Barnard*, 41 Fed. 358), the opinion stating that on filing a disclaimer of the claims held invalid complainants were entitled to a decree upon the other claims. Apparently no appeal was taken by the defendant and at that time plaintiff had no right of appeal from the dismissal. For some reason not apparent on the record, a decree was, according to the opinion of the court in the Third Circuit (p. 980), entered on June 11, 1892, without any disclaimer having been filed. Suit was brought in the Third Circuit on January 27, 1893. Defendant asserted (p. 980) that "The patent in suit is wholly void by reason of unreasonable neglect or delay" to enter a disclaimer. The Circuit Court of Appeals for the Third Circuit held (p. 986), "We must, therefore, hold that the Reid & Billinton apparatus did not anticipate any of the claims of the patent in suit, and consequently that Williames was under no obligation to enter a disclaimer," and held the patent valid.

Westinghouse Company v. *Stanley Co.*, 133 Fed. 167 (First Circuit). The patent was held invalid by the Circuit Court of Appeals for the Second Circuit (*Westinghouse Co.*

v. *Catskill Co.*, 121 Fed. 831), holding plaintiff's attempted antedating proofs to be insufficient. The Circuit Court of Appeals for the First Circuit upon more complete proofs held the patent valid. So did the Circuit Court of Appeals for the Seventh Circuit in *Diamond Meter Co.* v. *Westinghouse*, 152 Fed. 704.

Thomson-Houston Co. v. *Black River Traction Co.*, 135 Fed. 759 (Second Circuit). In this case the patent had been held invalid by the Circuit Court of Appeals for the Second Circuit in *Thomson-Houston Elec. Co.* v. *Union Ry. Co.*, 86 Fed. 636, and also by the Circuit Court of Appeals for the Sixth Circuit in *Thomson-Houston Elec. Co. v. Jeffrey Mfg. Co.*, 101 Fed. 121. Subsequently the patent was reissued. In the previous litigation (86 Fed. 636), plaintiff urged that the claim contains certain features by implication and therefore was not anticipated. The reissue specification contained a disclaimer limiting the claim to the features in question. It was held that the reissued claim was not for different inventions, and that the claim was valid.

Imperial Bottle Cap & Machine Co. v. *Crown Cork & Seal Co.*, 139 Fed. 312 (Fourth Circuit). Pending consideration of the case by this court, the Circuit Court of Appeals for the Second Circuit held the patent invalid. *Crown Cork & Seal Co.* v. *Standard Stopper Co.*, 136 Fed. 841. This court recognizing the doctrine of comity, nevertheless held the patent to be valid.

Pieper v. *S. S. White Dental Co.*, 228 Fed. 30 (1915). Patent held valid and infringed by the Circuit Court of Appeals for the Seventh Circuit. Previously in 1908 the patent had been held invalid by the Circuit Court of Appeals for the Seventh Circuit. *Pieper v. Electro Dental Mfg. Co.*, 160 Fed. 930.

In *Backstay Machine & Leather Co.* v. *Hamilton*, 262 Fed. 411 (1920), certain claims were held invalid. In a subsequent suit, *Backstay Machine & Leather Co.* v. *Zenite Metal Co.*, 293 Fed. 23, the Circuit Court of Appeals for the

Seventh Circuit held the same claims to be valid and infringed.

In *Wenborne-Karpen Dryer Co.* v. *Cutler Dry Kiln Co.*, 290 Fed. 625 (1923), the Circuit Court of Appeals for the Second Circuit held the patent void for lack of invention. After the decision in the Second Circuit, the defendant, in a pending suit in the Sixth Circuit, moved to dismiss upon the ground of privity between the parties. The Circuit Court of Appeals in the Sixth Circuit overruled the plea of privity, reversed a decree of the lower court dismissing the bill, and remanded the case for hearing on the merits. *Wenborne-Karpen Dryer Co.* v. *Dort Motor Car Co.*, 14 Fed. (2d) 378.

In *Franc-Strohmeyer & Cowan* v. *Arthur Siegman*, 27 Fed. (2d) 785, the patent was held valid after it had been held invalid by the Circuit Court of Appeals for the Sixth Circuit, *Forchheimer* v. *Franc, Strohmeyer*, 20 Fed. (2d) 553.

Comment by Counsel.

Except as noted in the foregoing footnotes, the footnote in the opinion of the Circuit Court of Appeals is believed to be entirely accurate.

Petitioners' criticisms with respect to *Expanded Metal Co.* v. *Bradford, Diamond Rubber Co.* v. *Consolidated Rubber Tire Co.; Railroad Supply Co.* v. *Elyria Iron & Steel Co.; Abercrombie & Fitch* v. *Baldwin; Meccano Ltd.* v. *John Wanamaker; New York Scaffolding Co.* v. *Chain Belt Co.;* and *Saranac Automatic Mach. Corp.* v. *Wirebounds Patents Co.;* are directed merely to the claim that at the time of the decision in one Circuit Court of Appeal invalidating the patent, there was a previous decision upholding the patent, or that the plaintiff had pending suits in other jurisdictions in which later the patent was held to be invalid. If this criticism be valid it can only be because such pendency is deemed to be the equivalent course sug-

gested in *Ensten* v. *Ascher,* 282 U. S. 445, i.e., that the patentee is diligent in "vindicating his position."

The criticism against *Dowagiac Mfg. Co.* v. *Minnesota Moline Plow Co.; and Hanover Star Milling Co.* v. *Metcalf;* merely emphasizes that in petitioners' view litigants in other cases are not estopped by the first adverse decision of a Circuit Court of Appeals.

APPENDIX B.

Chronological Statement of Steps in Litigation. (Data Relating to Title Suits in Italics).

1927, Sept. 20.—Suit filed in District of Delaware against Radio Corporation of America charging infringement of patents in question.

1928, Nov. 19.—Suits consolidated for purposes of trial.

1928, Nov. 19 to 1928, Dec. 12} Trial in open court.

1929, Apr. 1.—Argument on pleadings and proofs.

1929, Aug. 12.—Opinion of Judge Morris in District Court holding patents valid and infringed, filed.

1929, Sept. 21.—Petition for rehearing filed.

1929, Oct. 7.—Rehearing denied.

1929, Oct. 11.—Interlocutory decree finding patents valid and infringed entered.

1929, Oct. 11.—Appeal allowed defendant.

1930, Apr. 19.—United States files two suits in the U. S. District Court for the Eastern District of New York, against Percival D. Lowell, to secure title in Letters Patents 1,455,141 and 1,606,212.

1930, Apr. 19.—United States files three suits in the Supreme Court of the District of Columbia, against Francis W. Dunmore, to secure title in all three Lowell and Duunmore patents.

1930, Apr. 19.—United States files suit in the U. S. District Court for the Southern District of Maine, against Morkrum Company, to secure title in Dunmore patent 1,635,117.

1930, Apr. 22.—Suit filed in District of Delaware against Dubilier Condenser Corporation by United States alleging ownership of the inventions and seeking to acquire title to the patents in question.

1930, July 28.—Consolidated record on appeal in infringement suits filed with Clerk Circuit Court of Appeals, Third Circuit.*

1930, Oct. 7.—Title suits consolidated for purposes of trial.

1930, Oct. 7, 8, 9, 10.—Trial of title suits in open court.

1930, Nov. 24.—Hearing on pleadings and proofs in title suits.

*The Appellate Court being informed of the pendency of the title suits brought by the United States in the Delaware District argument of infringement suits was postponed until trial, decision and appeal in title suits.

1931, Apr. 27.—Opinion of court sustaining title in patentees, filed.

1931, May 5.—Final decree dismissing bill filed by United States, re Title to patents.

1931, June 5.—Order allowing appeal by United States.

1931, Nov. 7.—Record on appeal by United States in Title suit filed with Clerk Circuit Court of Appeals, Third Circuit.

1931, Dec. 10.—Title suits argued before Court of Appeals.

1931, Dec. 12.—Infringement suits argued before Court of Appeals.

1932, Jan. 23.—Albert S. Blatterman filed Bill in Equity in the Supreme Court of the District of Columbia, Equity 53,937, against Lowell and Dunmore, under R. S. 4915, to secure reversal of the opinion of the Board of Appeals dated July 25, 1931.

1932, Mar. 18.—U. S. Circuit Court of Appeals for the Third Circuit reversed the District Court opinion with respect to claims 3 and 14 of patent 1,455,141, and held claims 3 and 14 invalid; U. S. Circuit Court of Appeals reversed District Court with respect to claim 9 of patent 1,635,117. (59 Fed. Rep. (2d) 305).

1932, May 24.—Opinion of Court of Appeals, Third Circuit, affirming decree dismissing bill by United States. Re Title to patents, filed.

1932, July 6.—Petitions for rehearing denied by U. S. Circuit Court of Appeals for the Third Circuit, with respect to claims 3 and 14 of patent 1,455,141.

1932, Aug. 24.—U. S. of America filed petition for certiorari in the Supreme Court of the United States in the cases of U. S. of America v. *Dubilier Condenser Corporation.* (Title case.)

1932, Sept. 24.—Petition for certiorari to Supreme Court of the United States, in the infringement suits of *Dubilier Condenser Corporation et al.* v. *Radio Corporation of America.*

1932, Oct. 17.—Certiorari granted upon petition of United States, re title to patents.

1932, Oct. 25.—Certiorari denied upon petition of plaintiffs in infringement suits.

1933, Apr. 10.—Opinion by Supreme Court affirming decree dismissing bill by United States, Re Title to patents. (289 U. S., 178.)

1933, June 8.—United States dismisses three bills of Complaint against Francis W. Dunmore for title in the Supreme Court of the District of Columbia.

1933, July 3.—United States dismisses two suits against Percival D. Lowell for title in the United States District Court for the Eastern District of New York.

1933, July 8.—Disclaimers filed in the United States Patent Office with respect to patents 1,455,141 and 1,635,117.

APPENDIX C.

The Nature of the Inventions and the Errors of the Circuit Court of Appeals for the Third Circuit.

1. The Utility of the Inventions and Commercial History.

Prior to the inventions of the patents in suit the universal practice in the operation of radio receiving sets depending upon the use of vacuum tubes for their operation was to use a storage battery (called the A battery) to supply the heating current for the filament (i. e., cathode) of the tubes, a large dry cell (called the B battery) for supplying current to the plate circuit, and a small dry cell (called the C battery) for maintaining the grid of the tube at a predetermined normal potential.

By the adoption of the inventions users of radio broadcast receiving sets have been enabled to connect their sets with the ordinary alternating current house lighting supply mains, with entire relief from the old burden and expense in recharging storage batteries for heating filaments and renewing dry cells for plate circuits and grid circuits.

2. The Prior Commercial Broadcast Receivers.

The earliest of the radio broadcast receivers employing the three-electrode vacuum tube was the Aeriola, Sr., put out by Westinghouse Electric & Manufacturing Company in 1922. (Vol. II, p. 641.) The circuit of this set is shown at Vol. II, p. 642.

In this set the received signal, as before, is received by the antenna and passed through the "tuner" circuit, but now is impressed upon the grid of the vacuum tube, thus causing the potential on the grid to vary as indicated in the graph immediately below the "regenerative detector and amplifier." Here, as before, the lower half of the high frequency waves is suppressed and the waves vary in amplitude in accordance with the modulation frequency, but in going through the tube the amplitude of the waves is in-

creased and by reason of being bed back into the grid circuit and again passed through the tube the amplitude is still further increased, as indicated in the lower graph immediately above the tube. Therefore in the telephones we now have the modulation frequency of much greater power than in the crystal detector.

The Aeriola, Sr. was soon followed by an " R. C." set (Vol. II, pp. 643-649). In this set the output of the tube was coupled to the input of another tube and the output of the second tube connected to the input of a third tube, thereby further amplifying the detected signal.

Examples of these regenerative sets are found in plaintiffs' Ex. 8 (physical) and 66 at page 643 of Vol. II.

The tubes of these regenerative sets were powered by batteries. The apparatus employed is shown in the cut at Vol. II, p. 649. The filaments were energized by a large storage battery connected to the wires depending from the set. The plate circuit was energized by a large dry battery known as a B battery shown at the left of the set.

These regenerative sets constituted the great bulk of the receiving sets on the market (Van Deventer, Vol. I, p. 230).

3. Commercial Development on Behalf of Lowell and Dunmore.

In April, 1922, with the full approval of the Bureau of Standards, Mr. Dunmore read a paper before the *American Institute of Electrical Engineers* describing the invention of the amplifier patent 1,635,117 (Pltffs.' Ex. 53, Vol. II, p. 623). In July, 1922 the *Bureau of Standards* published a bulletin (Pltffs.' Ex. 106, Vol. II, p. 761) describing the inventions of the receiving set patent 1,455,141, and the amplifier patent 1,635,117. In July, 1922 Mr. Lowell read a paper before the *American Institute of Electrical Engineers* (Pltffs.' Ex. 21, Vol. II, p. 605). The alternating current operated receiving set described in these publications is now before the Court as Pltffs.' Exs. 19 and 20 (physical). The above papers were followed by similar descriptions in

numerous other magazines, for example, *Radio* for September, 1922 (Pltffs.' Ex. 21, Vol. II, p. 608); *Telephone* for September, 1922 (Vol. II, p. 616); *Q. S. T.* for October, 1922 (Vol. II, p. 613); *Radio News* for September, 1922 (Vol. II, p. 615); *Radio News*, July, 1922 (Vol. II, p. 627); *Radio*, November, 1922 (Vol. II, p. 631); *Radio Broadcast*, October, 1922 (Vol. II, p. 599).

The inventions at the time also attracted the attention of the newspaper publications such as the *New York Times*, April, 1922 (Vol. II, p. 600); *Washington Herald*, April, 1922 (Vol. II, p. 601); *New York Globe*, April, 1922 (Vol. II, p. 602); *Washington Post*, April, 1922 (Vol. II, p. 603); *Washington Star*, April, 1922 (Vol. II, p. 604).

Representatives of various manufacturers visited Mr. Dunmore's laboratory (Brady, Vol. I, p. 315).

On June 1, 1922, a license was granted to the Radio Instrument Company (Pltffs.' Ex. 51, Vol. I, p. 405) and Mr. Lowell severed his connections with the Bureau of Standards and became chief engineer of that company and built a set for demonstration (Exhibits 24-25 Physical Brady, Vol. I, pp. 312-313). The Radio Instrument Company license was exclusive until 1923, and the company was unable to raise funds to exploit the invention. Hence the inventors were practically blocked in their efforts to exploit the inventions until July, 1923 (Brady, Vol. I, p. 313).

Representatives of various manufacturers visited Mr. Dunmore's laboratory (Brady, Vol. I, p. 315). The set at the Bureau of Standards and the publications above referred to attracted much attention. For example, the *Westinghouse Electric & Manufacturing Company*, in its publication the *Electrical Journal* for December, 1922 (Pltffs.' Ex. 55, Physical Exhibit) the footnote, made mention of one of the Lowell publications in the Journal of the *American Institute of Electrical Engineers* (Vol. II, p. 605).

In May, 1923, Mr. Brady sent a copy of patent No. 1,455,141 to the *General Electric Company* (Vol. I, p. 313) but that company was not interested (Vol. I, p. 314).

In July, 1923 the attention of the Westinghouse Company was called to the patent, but that company claimed that every material part of the invention was shown in a prior application of its own (Pltffs' Ex. 52, Vol. I, p. 409). The application subsequently was placed in interference with the Lowell & Dunmore patent and decided adversely to Westinghouse.

In November, 1923 the *Radio Corporation,* after considering the purchase of patent 1,455,141, wrote that it considered the patent to be invalid and that it was not interested (Pltffs' Ex. 10, Vol. I, p. 391). During the summer and fall of 1923 the inventors were building another receiving set (Vol. I, p. 314). This set is in evidence as Pltffs' Ex. 48, and Ex. 47 (Vol. II, p. 620) is a photograph thereof.

In the latter part of 1923 Mr. George H. Lewis heard that an alternating current set had been developed in Washington and early in 1924 took Mr. Crosley of the *Crosley Radio Corporation* to see it (Vol. I, p. 303). They saw the set (Pltffs' Ex. 26-47) operated, but although it operated properly (Vol. I, p. 310) they thought it too complicated for their business which comprised simple and cheap sets (Vol. I, p. 303).

The set was also demonstrated to numerous other radio concerns, such as the *Timmons Radio Product Corporation*, the *Pathe Phonograph & Radio Corporation* and the *Wired Radio Company* (Vol. I, p. 315).

Early in 1924 it was exhibited to the Brandes Laboratories (Brady, Vol. I, p. 315).

In the spring of 1924 Mr. Freed of the *Freed-Eisemann Company* visited Washington and saw the receiving set (Freed, Vol. I, p. 342). He considered it satisfactory and arranged for the Freed-Eisemann Company to forward one of its battery operated receiving sets to Washington (Freed, Vol. I, p. 342) which was done in June, 1924 (Brady, Vol. I, p. 316). This set was converted to embody the invention (Freed, Vol. I, p. 342) and was sent to the

Freed-Eisemann Company in New York. This set is in evidence as Pltffs' Exs. 27 and 28. Pltffs' Ex. 49 (Vol. II, p. 621) is a photograph of the set. Shortly thereafter Mr. Freed went to Europe and on his return found that his partner had returned the set to Lowell and Dunmore fearing that its manufacture might entail infringement upon other patents (Freed, Vol. I, p. 342).

In October, 1924 (Vol. II, p. 570) agreements were made with the respondent *Dubilier Condenser Corporation.*

During 1924, 1925 and 1926 a number of licenses were granted to the following parties (Vol. I, pp. 368-369):

Dubilier Condenser Corporation
The Timmons Radio Product Corporation
The Fansteel Products Company
The Grigsby-Grunow-Hinds Company
The Willard Storage Battery Company
The Elkon Works, Incorporated
The Argus Radio Corporation
The Brandes Products Corporation
The Briggs-Stratton Corporation

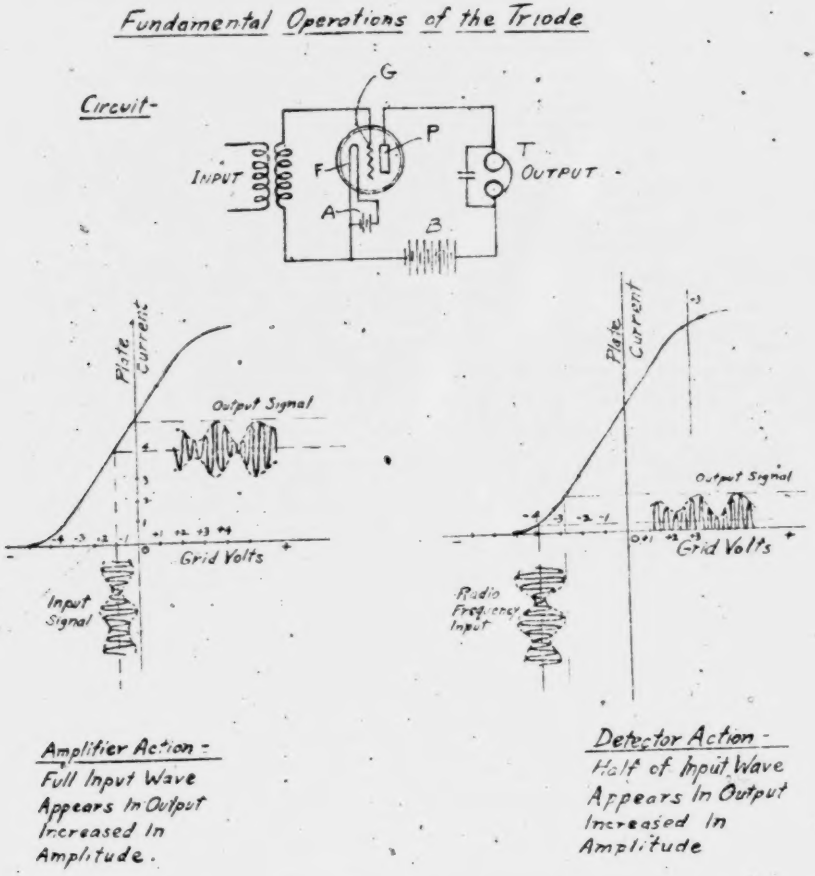
The license fees amounted in 1926 to $7,000, in 1927 to $21,000, and in 1928 to $22,710. The total royalties received up to the time of the trial in Delaware amounted to $50,710 (Sweeney, Vol. I, pp. 337-338).

After the Dubilier Condenser Corporation (Vol. I, pp. 371-380) had expended several hundred thousand dollars in commercial development (Vol. I, p. 231), and license agreements had been made with several manufacturers, the Radio Corporation and its associated companies in the fall of 1927 manufactured and put upon the market large quantities of infringing alternating current operated receiving sets, with the result of substantially destroying the business built up under the patents by the Dubilier Condenser Corporation (Vol. I, p. 231).

4. Causes of Hum in Vacuum Tube Radio Receivers.

The fundamental operation of the vacuum tube, upon which the operation of the modern radio receiver depends, is described in the opinion of this Court in *DeForest Radio Co.* v. *General Electric Co.*, 283 U. S 420.

The accompanying diagram shows the input circuit to the grid G, the circuit from battery A to heat the cathode F, and the circuit from battery B to furnish the local power for the plate circuit.



The importance of the tube for its use as a radio receiver depends upon the fact that variation of voltage on the grid G controls the electron stream from cathode F to plate P

and upon the fact that the power required to change the voltage on grid G is almost negligible and the local power controlled by this change in voltage is many times greater. Hence the incoming signal of very weak power applied to the grid is "amplified" in the output circuit.

The action of the tube is usually described with respect to a "characteristic curve," shown in the diagram, whereby increase of grid voltage causes a rise in the plate current as indicated in the heavy curved lines.

The increase of grid voltage from zero produces relatively small change in plate current; the further rise of grid voltage produces a uniform change and as the tube approaches saturation the change in plate current diminishes with a given rise in grid voltage. The curve therefore is frequently referred to as having a knee at the lower and upper ends and a straight portion in the middle. When the tube is operating as an amplifier a fixed normal voltage is applied to the grid to cause the variations to occur above and below a fixed point, such as 4. When the tube is to operate as a detector the applied grid voltage should be such as to cause the normal operation to occur at one of the knees of the curve, indicated at −4. Under this condition a rise in voltage above the normal point causes a greater increase in the amplitude of the wave than does a drop in grid voltage below the normal voltage, thus in effect cutting off one-half of the wave.

(a) If the biasing potential on the grid is not a steady unvarying potential, such as is derived from a "C" battery, the varying grid potential will reproduce a similar and amplified variation in the plate circuit.

(b) If the variation in grid potential is of sufficient amplitude, as for example if it comes from a local power source, it may be sufficient to change the grid potential to such an extent that the operating point of the tube will be raised or lowered to one of the knees of the curve, in which case the amplitude of the several cycles of the signal current will be changed, thus destroying the "modulation" carried

by the signal frequency, and in this case the distorted signal frequency will be amplified, and cannot be restored in any subsequent stage of the receiver.

(c) The incoming signal is very weak, whereas local power frequencies are relatively strong. Hence in the input stage of the receiver the power frequency would be so large in amplitude as to drown out the signal frequency altogether, and may distort the modulation.

(d) The wires of a radio receiver are in themselves miniature antennae and local oscillating current induces similar oscillating voltages in the plate circuits which tend to vary the frequency in the plate circuit and, if passed on to subsequent tubes, are amplified and may eventually drown out the signal.

(e) If the current employed to heat the cathode is alternating or fluctuating, the electron emission from the cathode likewise varies, thus varying the electron stream, and these variations are passed on to subsequent tubes.

5. Dunmore Patent No. 1,635,117.

This invention was conceived of by Dunmore on August 5, 1921 and reduced to practice December 16, 1921. (*United States* v. *Dubilier Condenser Corporation*, 289 U. S. 178, 184). It is therefore earlier in date than the other two patents in suit although the patent was issued later.

The particular feature of the patent here in controversy relates to the operation of the audio frequency amplifier from household alternating current, which is the subject matter of claims 9, 11 and 12. For convenience we here insert a copy of Fig. 1 of the Dunmore patent.

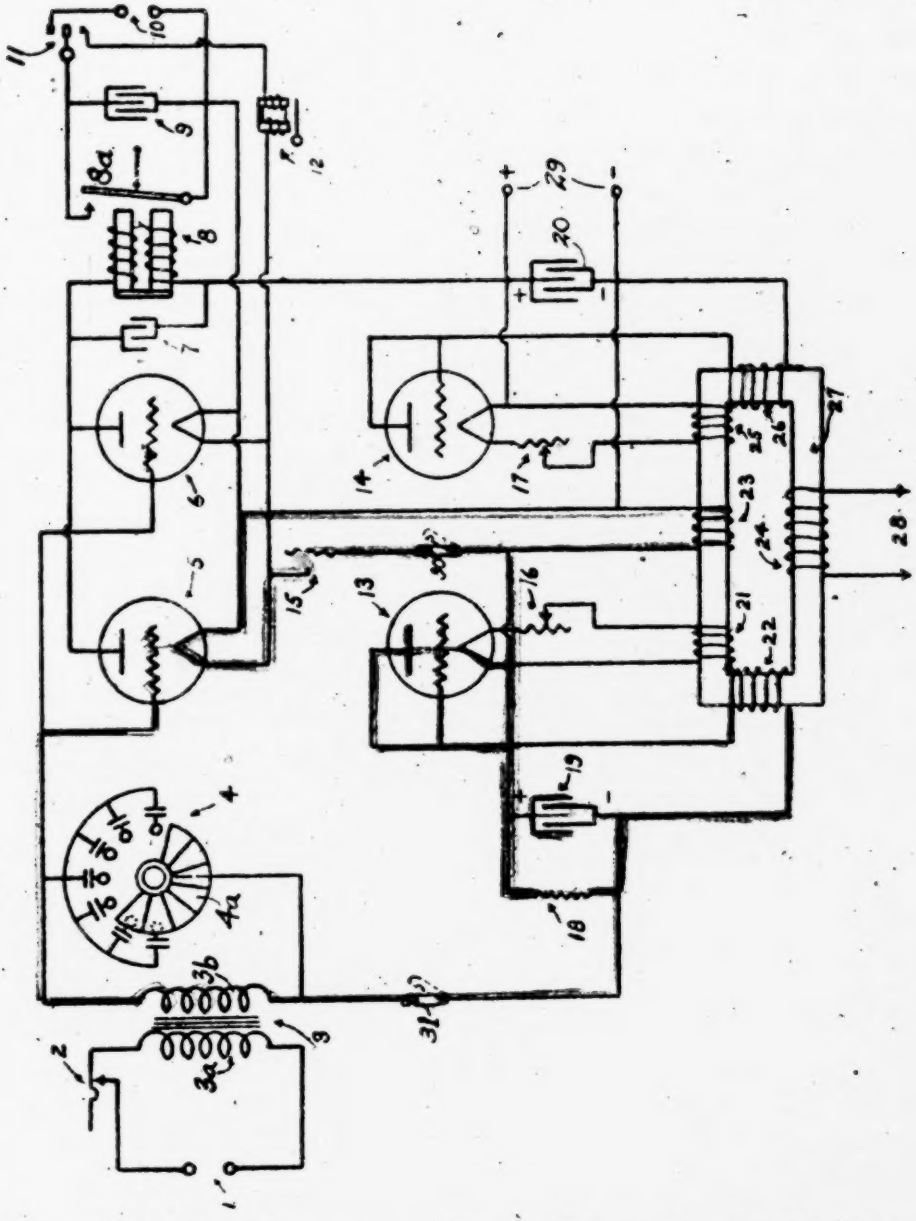


Fig. 1 of Dunmore audio amplifier patent 1,635,117.
(Colors added by counsel.)

At the time of taking out the patent Dunmore's immediate application of the low frequency relay was its use to operate a relay from a selected incoming low frequency signal either wire or wireless which the relay would amplify, and deliver to a magnet 8 in the output circuit, which magnet being actuated would open or close a switch 8a.

In the apparatus disclosed the primary winding 3a receives a low frequency signal, either in the form of long radio waves such as from the Annapolis station (p. 4, lines 6-10) or by wire, as from the output of a radio detector (p. 1, lines 11, 100; p. 2, line 12; p. 3, line 114 to p. 4, line 10).

The particular frequency desired may be selected by tuning the input circuit to the amplifier by means of the variable condenser 4.

The amplifier tube, to be operated as an *amplifier* requires the maintenance of a constant negative potential on the grid, called the biasing potential, in order to cause the tube to operate upon the straight part of its characteristic curve (*ante* p. 42). When the tube is powered by direct current this grid biasing potential is furnished by a C battery; the filament is heated by an A battery and the plate energized by a B battery.

Dunmore proposed to apply alternating current in all three of these places, one of which, the grid, is the most sensitive part of the tube, and moreover to use alternating current within the audible range. To state his task is almost equivalent to stating its impossibility of performance.

The means for attaining the desired objective as shown and described in the patent, comprise:

(a) for the A battery he substituted raw alternating current.

(b) for the B battery he substituted rectified current, rectified by the rectifier tube 14, and more or less smoothed out by connecting a condenser 20 in circuit, whereby the pulsating current from the rectifier charged and discharged the condenser (p. 2, lines 101-103).

Rectified current is illustrated in the cut here inserted. The upper line indicates the wave form of alternating cur-

rent. The middle line the rectified current. By using two rectifier tubes, both halves of the wave may be utilized as shown in the bottom line.

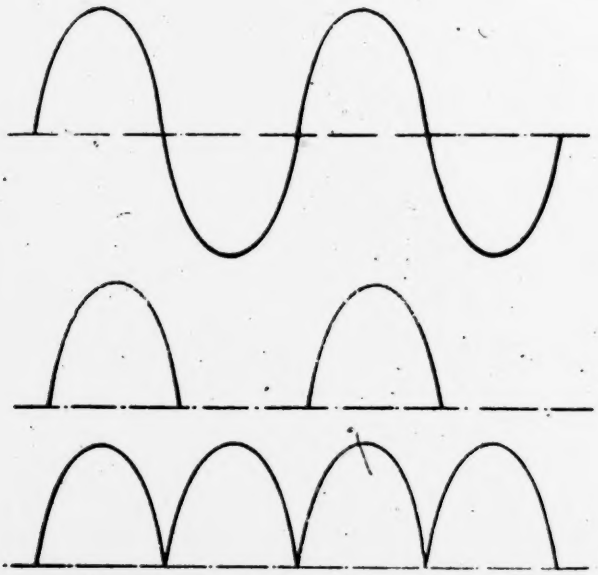


Figure 7. Diagram illustrating rectification.

The rectified current is still a pulsating current which, if strong enough, will be heard as a hum in the loud speaker, or if imparted to the grid of the tube will be greatly amplified and heard in the speaker.

(c) For the C battery he substituted rectified current, i. e., a pulsating current from rectifier 13 direct to the grid circuit, *and in the grid circuit he located a high resistance 18 (p. 2, lines 109-112) shunted by a condenser 19* (p. 2, lines 99-101).

Curiously enough, although each of these separate instrumentalities in itself cannot eliminate hum, the combination as a whole does function effectively.

A resistance offers the same impedance to current regardless of frequency. A condenser on the other hand offers more impedance to low frequency current than to high frequency current. Although both the signal current and power current are of audible frequency, the power cur-

rent is near the lower limit of audibility, i.e., 60 cycles, whereas the average speech or music will be from 100 or 200 up to 9,000 or 10,000 cycles. Hence the signal current freely passes through the condenser while the power voltage serves only to charge it every half cycle. Thus the condenser serves as a reservoir for the power current and a low resistance path for the signal current. The resistor being in shunt with the condenser permits a limited current to flow out of the condenser, but as the condenser is charged 60 times per second the resistor does not permit all the current to discharge from the condenser and hence the *voltage* across the resistor remains at a substantially steady value. This is due to the large reservoir action of the condenser. The slight variation across the resistor at the power frequency only produces a relatively small variation of potential on the grid, which small variation at 60 cycles is drowned out by the large incoming signal current variations of higher, but audible, frequency.

A condenser and a resistance of given values connected in parallel in an electric circuit are capable of unique action. If the current flowing is alternating, as in the case considered, the condenser will be periodically charged, and will discharge across the resistance. The circuit of the condenser and resistance possesses a characteristic known as its time constant which is equal to the product of RC (R = resistance, and C = capacity) and if the frequency of the energizing current is conducive to this time constant, the current will be passed freely; but if not conducive, the current will be suppressed. In other words, the resistance-condenser combination is selective of the frequency passed, and when suitable sizes of condenser and resistance are employed, the combination can be made effective to pass current of signal frequencies and suppress current of hum frequencies by having a time constant too small for the low hum frequencies to coact with—that is, the condenser does not charge and discharge with the alternations of the low frequency hum current, which is necessary for the current to pass, and the hum current is, therefore, suppressed.

The combination is, therefore, in effect, a filter, blocking currents of undesired frequencies. The units—condenser and resistance—do not function separately to pass currents of different characteristics, but in cooperation to select and pass desired currents and suppress undesired currents by reason of their frequency and the characteristic time constant of the selective circuit.

In the modern radio receiver the signal strength, even though in the audio range, is so much stronger and of sufficiently high frequency to make any low power frequency substantially inaudible.

The Claims in Suit

Claims 9, 11 and 12 are in suit.

Claim 9 is directed to the combination with an audio frequency amplifier having the usual grid, filament and plate electrodes, of a source of alternating current, a rectifier, "*means* for supplying a negative potential to the grid electrode of said electron tube from said source of alternating current and *means* for supplying a positive potential to said plate electrode from said source of alternating current" whereby the amplifier operates without interference from the source of alternating current.

The specific form of "means" shown in the patent comprises *the parallel resistance 18 and condenser 19 in the grid* circuit, and the *condenser 20 in the plate circuit* whereby, notwithstanding the use of raw alternating current in the cathode heater circuit, the required potentials are maintained without creating excessive hum.

Claim 11 is specific to the resistance across the output side of the filter and carrying relatively large current compared with the load, i.e., relatively large rectified power current compared to the negligible value of the grid current, thus further serving to smooth out fluctuations in the grid current.

Claim 12 is a method claim directed to the method of applying filtered current to a resistance and impressing the voltage drop therefrom upon the tube.

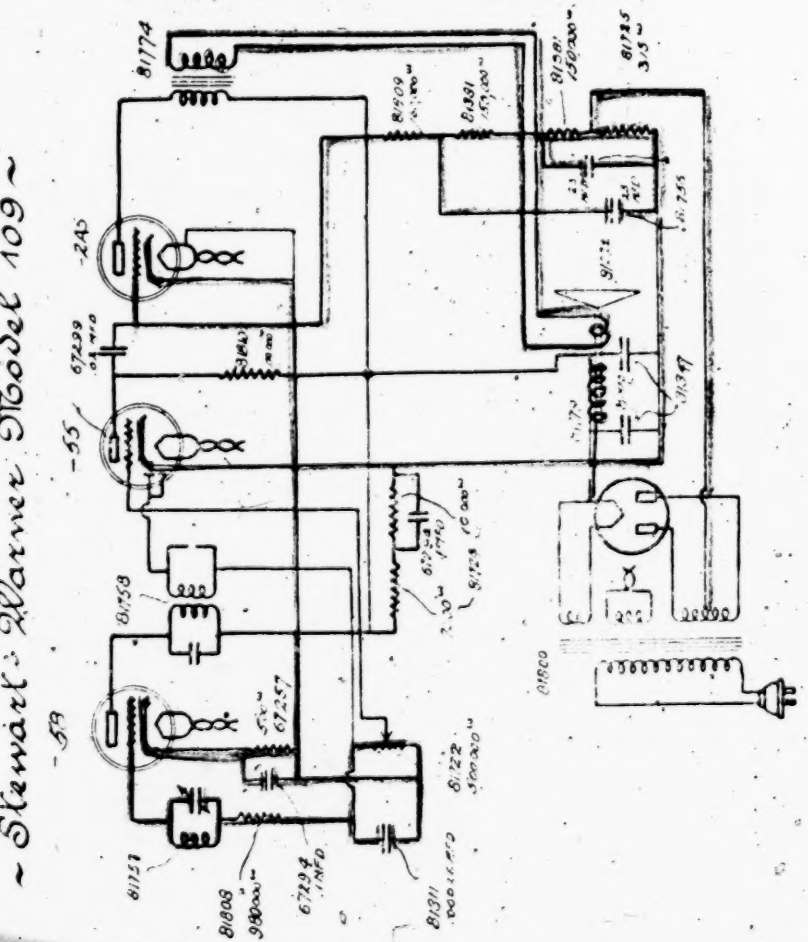
The Petitioners' Infringing Amplifier.

The circuits employed in the several types of petitioners' receiving sets in the audio frequency portion are shown in detail in the Plaintiffs' Exhibit 77, sheets 1-4 inclusive (Vol. II, pp. 664-667). Dr. Lee has also shown them in simplified and elemental form in the Plaintiffs' Ex. 81 (Vol. II, p. 672).

For convenience we insert a copy of Plaintiffs' Ex. 95 (Vol. II, p. 734) colored by counsel, being a simplified diagram of petitioners' Model 109 receiver, which is typical of other models.

Plaintiffs' Exhibit No. 95.

(Simplified diagram of set SW 109.)



Rectified alternating current is delivered from the power output to the input circuit of tube —2A5, which circuit includes the grid of the tube and a high resistance shunted by a condenser whereby in operation the resistance functions to force the alternating current to charge the condenser which latter permits the signal current in the grid circuit to pass freely, and also functions to supply the necessary voltage drop and small supply of energy necessary to maintain the voltage drop on the grid. The circuit of the rectified alternating current in all of these models is from the plate of the rectifier to and through a resistance 81725, thence to the cathode, to the plate, and back to the cathode of the rectifier. Thus the rectified current is delivered across the terminals of a high resistance in the grid circuit shunted by a condenser, and operated to cause the combination to function as before described.

As in the Dunmore patent this operation is possible because of the power frequency being at the extreme lower end of the range of audible frequencis, whereas the speech and music frequencies are in general considerably above that range.

Model 109, therefore, infringes upon claim 9 of the patent.

Petitioners, to be sure, employ, in addition to the resistance and condenser above mentioned, a filter comprising an inductance coil and one or two condensers, in between the grid resistance and condenser and the power rectifier. But such filter is ineffective to remove all fluctuation from the output from the filter; indeed as appears from the proffered testimony (Vol. I, pp. 180-181) petitioners employ a relatively inexpensive filter having very substantial residual fluctuation, rather than go to the expense of using a filter which will smooth out the current to such an extent as to make it useful in the set without the use of respondents' inventions.

The Decision of the Circuit Court of Appeals for the Third Circuit with Respect to Patent 1,635,117.

In the previous litigation only claim 9 was involved.

This claim was upheld by Judge Morris in the District Court (*Dubilier Condenser Corp.* v. *Radio Corp.*, 34 Fed. (2d) 450), but was held to be invalid by the Circuit Court of Appeals (*Radio Corp.* v. *Dubilier Condenser Corp.*, 59 Fed. (2d) 309).

Judge Morris pointed out (p. 462) that there is no instance in the prior art of the employment of a resistance to obtain a negative grid potential in an amplifier tube operated from alternating current.

This fact is not controverted in the decision of the Circuit Court of Appeals, but interpreting the "means" of the claim to mean nothing more than a so-called "Hull" rectifier and filter* and that such Hull device transforms alternating current into a smooth current comparable to that from a battery, the Court held that all that Dunmore had done was merely to operate the tube by direct current in the same way in which tubes theretofore had been operated. The true construction of the claim should have identified the Hull device only as the "means" for supplying a positive potential to the plate circuit, and the resistance 18 shunted by condenser 19 as the "means" for supplying negative potential to the grid.

Contrary to this basic theory, the "Hull" rectifier and filter cannot smooth out the current to a degree comparable with the smooth direct current from a battery, except by the use of such a large number of filter elements as to make the cost prohibitive. In consequence manufacturers of commercial radio receivers use only a few filter elements and deliver to the grid and plate circuits rectified currents which pulsate to a degree which would give rise to substantial hum in the absence of preventative means.

The excluded evidence now before this Court under the provisions of Rule 46 shows (Vol. I, p. 253) that in fact the

*Hull patent 1,251,377, December 25, 1917, Vol. II, p. 547.

current "placed upon the grid circuit is not at all the steady direct current which is derived from a battery, but is a pulsating current, the voltage of which rises and falls in the same manner as in a true alternating current.

Respondents offered in the proffered testimony of Dr. Lee, to demonstrate this (Vol. I, p. 254). Mr. Lowell, in this proffered testimony, connected the phones and a loud speaker across the output from petitioners' filter, with the result that a pronounced hum from the fluctuations is audible (Lowell, Vol. I, pp. 254, 257).

In connection with the loud speaker patent 1,606,212 respondents did demonstrate their assertion in open Court upon the petitioners' Model 109 receiver (Pltffs.' Ex. 78) and are ready to make similar demonstration in this Court.

That the decision of the Circuit Court of Appeals for the Third Circuit would have been in favor of the patent if it had correctly understood the fact in this respect, is shown by the opinion of the Court, which indicates (p. 310) that the Court believed, as indeed the prior art did, that alternating current on the grid circuit would not do at all, for the Court said

> "substituted alternating current would not do the work of direct current in the tube."

And further (p. 310):

> "Here, as in the Lowell and Dunmore patent, there would be invention and a very important one had the patentee invented all its elements, or had he brought old elements into new cooperative function."

From these expressions it is clear that the Court felt that if Dunmore had in fact employed alternating current he would have accomplished the impossible, and that his combination in all its elements was not new. A part of the excluded evidence was that such elements are new (Vol. I, p. 262) and not shown in either the Heising or White patents referred to by the Court.

Yet, in point of fact Dunmore did not only apply raw alternating current to the filament but also applied alternat-

ing current to the grid and plate circuits, and his hum eliminating means attained successful operation.

A "Hull" filter would not accomplish the result, and no one before Dunmore even proposed its use for the purpose. Such a filter, as shown by the Hull patent (Vol. II, p. 776) employs only one or more inductance coils and condensers, no resistance. Nor would a resistance alone be sufficient, or a condenser alone. The two in shunt in the grid circuit cooperate in the peculiar manner previously set forth, *ante* p. 47.

Nor does Hull or any other reference disclose the resistance of relatively large value in combination with the filter as called for in claim 11, or the method of claim 12.

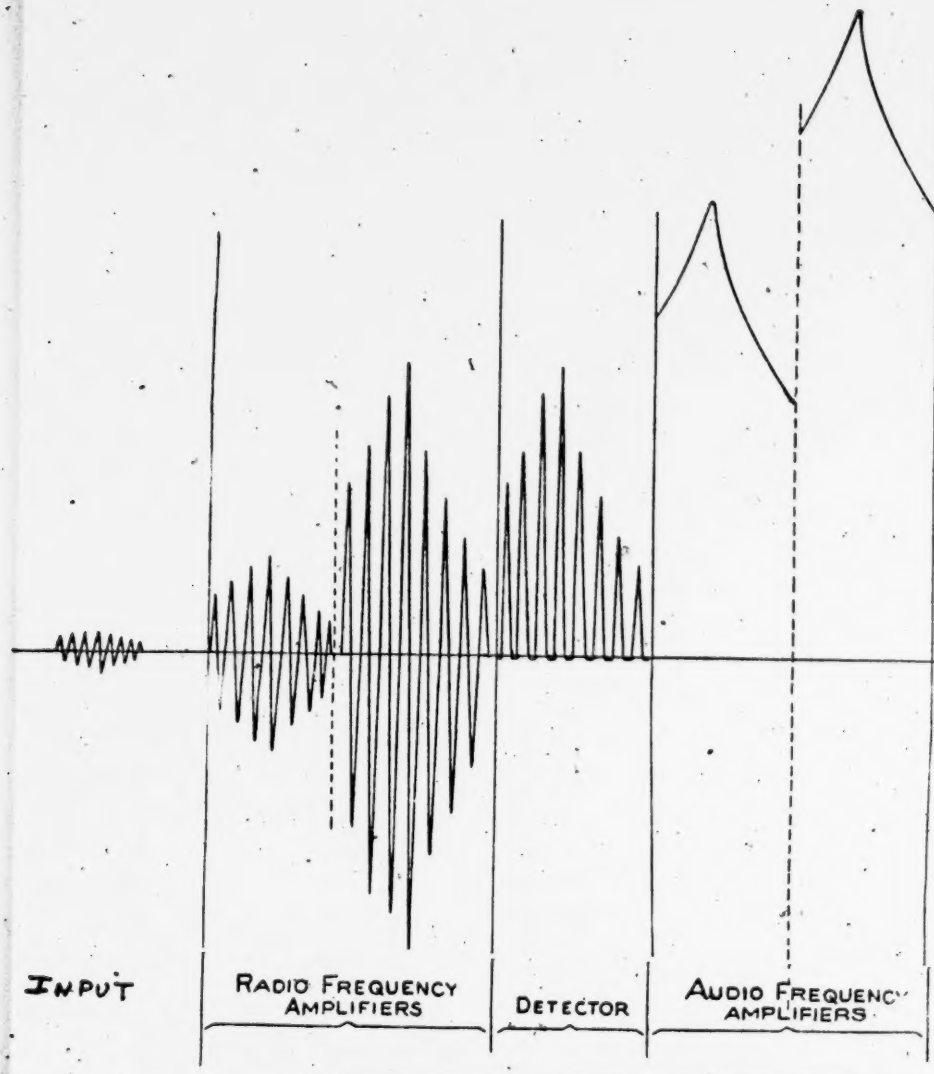
6. Lowell & Dunmore Patent 1,455,141.

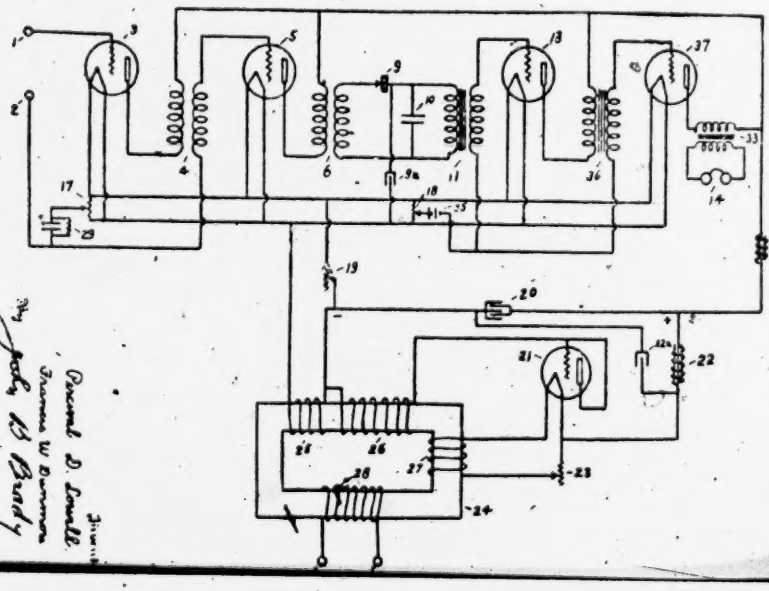
This patent deals with the broad problem of operating the receiver from alternating current.

As previously pointed out (*ante*, pp. 41, 42) the sources of hum are numerous and the power from those sources greatly exceeds the signal energy. A simple test upon almost any commercial radio receiver will show that in spite of all efforts to the contrary, no so-called hum eliminating means can entirely eliminate the hum from the alternating power current frequencies which creep into all parts of the set. The test is to turn on the power for the receiver and detune it so that no signal can be heard. A noticeable hum from the power frequency will be audible; this is what is left from the original power sources after every effort has been made to reduce the value thereof. But when the instrument is tuned to a transmitting station the speech or music having been greatly amplified will be heard and the hum will be drowned out and disappears for all practical purposes.

Lowell and Dunmore taught how to hear the signal in spite of the ever present hum.

The novel idea of Lowell and Dunmore was gradually to build up the signal strength without impairing the modula-


INPUT
RADIO FREQUENCY AMPLIFIERS
DETECTOR
AUDIO FREQUENCY AMPLIFIERS


RADIO RECEIVING APPARATUS
Filed March 27 1922

tion while simultaneously keeping out power current frequencies as far as possible and straining out such power current frequencies as might enter the circuits, thus keeping the hum level down while building up the signal level. (Lee, Vol. I, pp. 241-245).

To this end the receiver is divided into three portions.

For convenience we insert opposite this page a copy of Fig. 1 of the patent to which we have added (above the patent drawing) a diagram indicating the changes in wave form effected by the different portions of the receiver.

In the first portion known as the *radio frequency amplifier*, the incoming weak signal is amplified in exactly the same form in which it is received, without distorting the modulation, and without excessive hum level.

The hum eliminating means necessary for doing this comprise (a) connecting the grids of the tubes to the midpoint of a resistor 17, whereby the grid is not subjected to the influence of variations of the cathode heating current. This prevents the signal frequency from operating on one or the other of the knees of the characteristic curve of the tube and so prevents distortion of the signal and also materially reduces 60-cycle hum appearing in the plate circuit in amplified form, although this latter cannot be wholly avoided since actually there is always a small remaining power frequency that cannot be avoided in this way (Lee, Vol. I, p. 242); (b) the resistor 29 shunted by a condenser, whereby there is a drop in potential in the grid circuit, the effect of which is to impose the necessary bias upon the grid to cause the tube to act as an amplifier; the condenser functioning to smooth out fluctuations in that circuit; and (c) one or more radio frequency transformers 4, 6 which couple the radio frequency amplifier to the detector, whereby only radio frequencies are permitted to pass through the transformer and the unavoidable hum frequency (i.e., 60 or 120-cycle frequency) cannot pass, and hence there is delivered to the detector a strengthened undistorted signal with a relatively low level, or no level, of residual hum frequency.

The next portion of the instrument is the *detector* portion. Here the high frequency modulated current is detected, i.e., one half of each cycle of current is suppressed, as above shown with respect to the crystal set and the regenerative set. Lowell and Dunmore show in their drawings a crystal detector which has the advantage over a tube in that it does not itself inherently create hum as does the rise and fall of cathode temperature caused by applying alternative current to the cathode; the specification of the patent, however, states (p. 2, lines 26-58) that a tube may be used, although subject to the disadvantages mentioned.

In this portion of the instrument, the hum eliminating means comprise, (a) a detector which does not inherently create hum itself, and (b) a means such as the condenser 9-A adapted to strain out such power current frequencies as may be induced in the circuit. Thus in this portion of the instrument Lowell and Dunmore again avoid distortion of the modulation, and as far as possible avoid the introduction of hum from the power circuit and to the extent introduced, drain it off.

In the *audio frequency* amplifier portion of the instrument the signal which has now been built up to a much greater level than the probable level of any hum frequency that may be introduced above in spite of the hum eliminating means, i.e., connecting the grid circuit to a point in the cathode not affected by the alternating current. In consequence any residual hum is drowned out by the signal and will not be heard.

Thus Lowell & Dunmore accepted the impossibility of keeping hum out of the several parts of the instrument, except at prohibitive cost, and devised their instrument so that it operates in spite of the disadvantage.

The Claims in Suit.

Claims 1 to 4 and claims 13 and 14 are in suit.

Claim 1 is for the broad idea of the radio frequency amplifier followed by a detector, and hum eliminating means

in circuit with the amplifying means, which hum eliminating means, under well known rules of construction regardless of the language used in the claims, must be the same or substantially the same as the means shown in the patent.

Claim 2 is also to the combination of the radio frequency amplifier and a detector, but there is the additional limitation that the means for eliminating hum shall be connected to both the amplifying and the rectifying means, thereby implying the necessity of means such as a crystal or a tube adapted inherently not to create hum, and means for draining off such power frequencies as may be induced in the circuit.

Claim 3 includes as an additional limitation that there shall be an amplifier for the audio frequencies and that there shall be *"separate"* means connected to each of the amplifying and rectifying means for eliminating hum thus requiring the foregoing hum eliminating means for the radio frequency amplifier and the rectifier and means in the audio frequency portion, such as the midpoint connection, for keeping out power current frequencies.

Claim 4 likewise includes the above three portions of the instrument and calls for hum eliminating means for each portion of the instrument.

Claim 13 calls for the same three portions of the instrument and in addition means for rectifying the energy from the power supply and also the *"separate"* means for eliminating hum called for in claim 3.

Claim 14, like claim 13, calls for the three portions of the instrument, the rectifying means and also the *"separate"* means in each of the circuits for eliminating hum.

Infringement of Patent 1,455,141

All of the appellees' receivers are of the so-called superheterodyne type. This type of set is illustrated fundamentally in the diagram Pltffs' Ex. 76, Vol. II, p. 663.

In this type of receiver the incoming signal at high frequency is usually, although not always, first amplified;

whether amplified or not, it is delivered to the input of a "converter" tube, the grid circuit of which receives not only the modulated carrier wave but also a local frequency derived from an "oscillator" tube. In the example shown the frequency of the modulated carrier input to the "converter" is 1060 kilocycles, whereas the frequency from the oscillator tube is a different frequency such that the two frequencies result in the production of a beat note frequency of, say, 177 kilocycles in the output of the converter. This frequency is known as the *intermediate* frequency. It is so high that it is inaudible, and therefore, must be rectified, i. e., detected, before it can be heard. Therefore the output from the converter is passed through an amplifier tube, then a detector tube and then through an audio frequency amplifier. We may therefore, in the consideration of appellees' sets, disregard that portion of the receiving apparatus which precedes the amplifier for the intermediate frequency, and consider only the intermediate (i. e., high) frequency amplifier portion, the detector portion and the audio frequency portion.

The model 109, respondent's receiver (see page 49 hereof) is typical.

Like the other types of appellees' sets, this set has indirect heated tubes, wherein the cathode is separated from the heater circuit by a material having suitable heat lag, thus causing the cathode to remain at nearly constant temperature in spite of variations in the heating current. Thus connecting the grid to the indirect heated cathode operates in the same manner as connecting it to the midpoint of a direct heated cathode, i. e., in both cases the grid is connected to a point on the cathode not subjected to the influence of variations of the heating current.

Like all of the other sets in controversy the set includes the amplifier portion for the "intermediate", (i. e., radio) signal energy; a means for rectifying this energy; and a means for amplifying the resulting audio frequency.

As in the other sets in controversy raw alternating current is applied to each of the circuits for heating the

cathodes, which heater circuits constitute effective transmitters of power frequency waves which induce currents of similar frequency in the adjacent conductors.

In *the radio frequency portion* of the instrument, the grid circuit of the radio frequency amplifier is not only connected to a point on the cathode not subject to variations in the heater current, but also includes a resistance shunted by a condenser (indicated in the 109 set by resistance 67257 and condenser 67294). Also in this portion the coupling transformer 81758 prevents power frequency current from passing to the detector. Thus in the radio frequency portion the level of the signal frequency is raised without distortion of the modulation signal and the introduction of power frequency is minimized, and such power frequency as enters at this portion is strained out by the transformer.

In the *detector portion of the instrument* the cathode of the 55 tube is indirectly heated whereby the tube acts in precisely the same manner as the crystal which does not create hum.

Thereby the portions of the set thus far described infringe upon claims 1 and 2 which are directed toward the combination wherein the high frequency signal is raised to high level without distortion in spite of being surrounded by unavoidable power frequencies and whereby the high level signal is separated from the power frequencies and delivered to the detector.

In the *audio amplifier portion* of the instrument the grid circuit of the 2A5 tube is connected through resistances 81809, 81381, 81725, to the circuit of the indirect heated cathode, thereby connecting the grid to a point on the cathode not subjected to the influence of variations of the cathode heating current.

Thus the receiver also infringes upon claims 3, 4, 13 and 14 which bring in the audio frequency amplifier portion and also bring in the feature of separation of the hum eliminating means in the several parts of the set.

Thereby the set as a whole not only delivers an undistorted strengthened signal but the level of power frequency

is kept down in the detector and there is delivered to the audio frequency portion of the instrument a strengthened undistorted signal having a level well above the hum frequency and in the audio frequency portion the level of unavoidable power frequency is again kept down to a minimum and since this power frequency is in the lower range of the audible frequencies carried by the signal, the result is that the powerful audio amplifier operates so that in spite of the fact that in the best instrument obtainable after all precautions have been taken to remove power frequency hum as much as possible, a hum can be heard when no signal is coming in but when the signal does come in only the desired speech and music is heard.

The Decisions of the Courts in Third Circuit With Respect to Patent 1,455,141.

The decision in the Third Circuit is in point only with respect to the limited claims 3 and 14 relating to the *separate* means for eliminating hum.

With respect to these claims Judge Hugh M. Morris in the District Court, after a careful analysis of the history of the inventions and the prior art, held (*Dubilier Condenser Corp.* v. *Radio Corporation of America,* 34 Fed. [2d] 450, 457):

> "Dr. Lee testified that the patentees' arrangement of the hum-eliminating means 'prevents the hum from becoming cumulative through the sets. It also has a great benefit, in that you can operate the various sections of each set adaptable to their maximum efficiency by selecting tubes suitable for each purpose and rectifying the hum in those sections to the best advantage.' Other witnesses testified to the same general effect. * * * *
> * * * I think the claims are valid."

The Circuit Court of Appeals reversed this holding in an opinion by Judge Woolley (*Radio Corporation of America* v. *Dubilier Condenser Corporation,* 59 Fed. [2d] 305). In

this opinion the Court treats the element "(f)", i. e., separate means, etc. for eliminating hum, as comprising nothing more than an old midpoint connection shown in Heising and White (Vol. II, p. 780) to stop the hum *at the source* in each portion of the instrument, whereby each portion of the instrument operates in the same way regardless of whether such portion operated separately or collectively.

Judge Woolley summed up the matter by stating (p. 307):

> "Therefore, in the final analysis, the claimed invention consists in applying *curbed alternating current* to the detector section and the audio frequency amplifier section and also to the radio frequency amplifier section in the same way that it had previously been applied to the last named section. Is this invention?" (Emphasis by counsel).

And further (p. 308):

> "So it appears that each eliminator performs in the apparatus of the combination claim the same function it performed in the device from which it was taken, *Motion Pictures Patents Co.* v. *Caleluff (C. C. A.)* 251 F, 598, 602; that is, *each does its own work in its own section and is through.* The result, in theory at least, is complete hum prevention or elimination in each section by each eliminator. It follows that *the effect of the operation of all the eliminators is an aggregation of separate results, Powers Kennedy Corp* v. *Concrete Co.*, 282 U. S. 175, 186, 51 S. Ct. 95, 75 L. Ed. 278, all alike and all admittedly obtained by prior art means. *From the very nature of the circuit connections, the three eliminators act independently of one another, Hailes* v. *Van Wormer*, 2 Wall. (89 U. S.) 353, 22 L. Ed. 241. *Operating separately yet in conjunction with other elements of the combination, they evolve no new cooperative function, Grinnell Washing Machine Co.* v. *Johnson Co.*, 247 U. S. 426, 433, 38 S. Ct. 547, 62 L. Ed. 1196; *Office Specialty Mfg. Co.* v. *Fenton Metallic Mfg. Co.*, 174 U. S. 492, 498, 19 S. Ct. 641, 43 L. Ed. 1058, and the new result, as claimed, is only that which arises from the well-known operation

of each one of the several elements of the combination, *Grinnell Washing Machine Co.* v. *Johnson Co.*, supra." (Emphasis by counsel).

This purely theoretical analysis not only has nothing to do with the basic and novel idea of initially building up the signal frequency without distorting it and separating such amplified signal energy from such power frequencies as may have entered, and then further progressively building up the signal strength in the several portions of the instrument while keeping out and straining out power frequencies so that they are kept down in amplitude and finally such as are present are drowned out, but is wrong in point of fact.

It is but fair to say that in the record before the Court in the previous case the operation in this respect was not clearly apparent.

But in the case at bar the excluded evidence and demonstration clearly shows that connecting the grid circuit to the midpoint of the cathode heater circuit, while effective to a large degree in preventing upbalancing of the voltage in the grid circuit, *cannot prevent some fluctuation* (Lee, Vol. I, p. 242) and this small fluctuation greatly amplified in the tube.

If the theoretical assumption forming the basis of the decision of the Circuit Court of Appeals for the Third Circuit to the effect that Lowell and Dunmore merely used in each stage the same old hum eliminating means were correct, the early regenerative receivers could have been made humless by the simple process of connecting the grids of the tubes to the midpoint of the cathode heater circuit. Such an arrangement in fact would only amplify and reamplify the residual hum to such an extent as to make the instrument useless. Had such a thing been possible obviously the regenerative set would have been operated by alternating current.

The excluded evidence included a demonstration of Exhibit 68 (Vol. I, pp. 247-248) which can be repeated here,

that notwithstanding the presence in each portion of the instrument, in spite of all efforts to the contrary, that these residual frequencies are not added together as one would expect in the case of an aggregation but actually diminish.

In the ***radio frequency amplifier*** portion of the instrument the signal frequency is very weak whereas the power frequency is relatively strong. By listening in on the phones tapped in at the output of this portion taken *separately* all that will be heard will be the residual hum, or at most some modulation accompanied by substantial hum. (Lee, Vol. I, p. 247).

At the *detector portion* taken *separately,* normally all that would be heard would be a faint signal which, unless preceded by signal amplification, would be drowned out or nearly drowned by residual hum; if preceded by amplificatibn normally adding the two together would merely increase the hum.

Yet coupling the two parts together by the radio frequency transformer, the result is *less* hum instead of more. The new combination keeps the hum level down while raising the signal strength and then straining out hum frequency.

This is the combination of claims 1 and 2 for which there is no anticipation, and which complies with all of the requirements of a true combination as distinguished from a mere aggregation.

Also the *audio frequency* portion of the instrument separately, if powered by alternating current would be useless. It becomes useful only when preceded by the foregoing radio amplifier, and detector, portions.

These matters not only appear in the testimony offered and excluded at the trial, but are capable of audible demonstration upon the apparatus offered.

It is, therefore, not the fact that each eliminator performs in the apparatus of the combination only the same function which it performed in the device from which it was taken. No hum eliminating means of the prior art was

arranged or adapted to strengthen the signal without distortion of the modulation and to strain out 60-cycle frequencies before delivery to the detector. No hum eliminating means of the prior art was adapted to permit rectification without distortion and drain off unwanted 60-cycle frequency before passing the rectified signal through the audio transformer and no hum eliminating means were arranged to operate in an audio frequency amplifier prior to Lowell and Dunmore. The application of alternating current to the audio frequency portion of the instrument was made possible only by Lowell and Dunmore's invention of first delivering to the detector an undistorted high frequency modulation from which power frequencies had been strained out by the transformer 4-6, and making the undistorted radio frequency so powerful that any 60-cycle frequency introduced at the audio portion would be drowned out by the signal.

Had the Circuit Court of Appeals not made the mistaken assumption of fact that nothing more was involved than the mere separation of parts containing already old hum eliminating means, it is believed to be clear from their opinion that the claims would have been upheld. This is shown by the language at p. 307:

> "It might be invention if, when operating, some hum should develop in the first section and pass over to the second section, or if hum in these two sections should invade the third section and be suppressed before it reaches the loud speaker by the three hum eliminators co-acting to that end. In other words, there might be invention if the hum eliminators, though separately placed, functioned together on the circuits of all sections in eliminating wandering hum."

Indeed in the earlier part of the opinion the Court said (p. 307):

> "This is a highly scientific organization, and this is what Lowell and Dunmore say they invented. Looking at it as they disclose it, that is, looking at

> it close up without looking at its background, it would appeal to any one as invention. If they had invented this apparatus and all its elements, their invention unquestionably would have been basic; it would have been more than that; it would have been stupendous, for it would have covered the major portion of the practical radio art as it stands today. But they did not invent all of these elements; indeed, they frankly admit they did not. What then is the invention?

Had the Circuit Court of Appeals been fully informed as to the basic facts showing how Lowell and Dunmore first divided the instrument into its component parts, and then applied the hum eliminating means to each part in such manner as to cause the combined three parts to operate to produce a result wholly unattainable by any of the parts individually and an operation in each part wholly different from the mere duplication of hum eliminating means in each part, it is believed to be clear that the result of the decision of the Circuit Court of Appeals for the Third Circuit would have been quite different from what it was.

In short, the reasoning of the Circuit Court of Appeals applied to the facts as they are, instead of what the Circuit Court of Appeals thought them to be, must, we submit, lead to an entirely different conclusion.